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CONTENTS

PAGE

Portrait of Henry Ingersoll Bowditch . . . . Cover

John Rogers Group of Poor Patient and Doctor . . . . . Frontispiece

The Two Heberdens (Part I) . . . . Sir Humphry Rolleston . . 409

Henry Ingersoll Bowditch . . . . . Adolph A. Walkling . . . 428

An Account of Theodore Turquet De Mayerne's "Praxis Medica" . . Thomas Gibson 438

The "De Ovorum Gallinaceorum Generationis Primo Exordio, etc." of Volcher Coiter (Part II, Conclusion) . . . . Howard B. Adelmann . . 444

Willard Parker (Part III, Conclusion) John Ruhräh 458

An Introduction to the History of Women in Medicine (Part II, Continued) . . . . Kate Campbell Hurd-Mead 484

Editorial 505

Teaching the History of Anatomy

Book Reviews 506

Lusk: Nutrition; History of Urology; Heidel: The Heroic Age of Science; Catalogus van de Bibliotheek der Nederlandsche Maatschappij tot Bevordering der Geneeskunst; Weber: Gedanken eines Arztes über Seele, Natur und Gott; Pusey: The History and Epidemiology of Syphilis.

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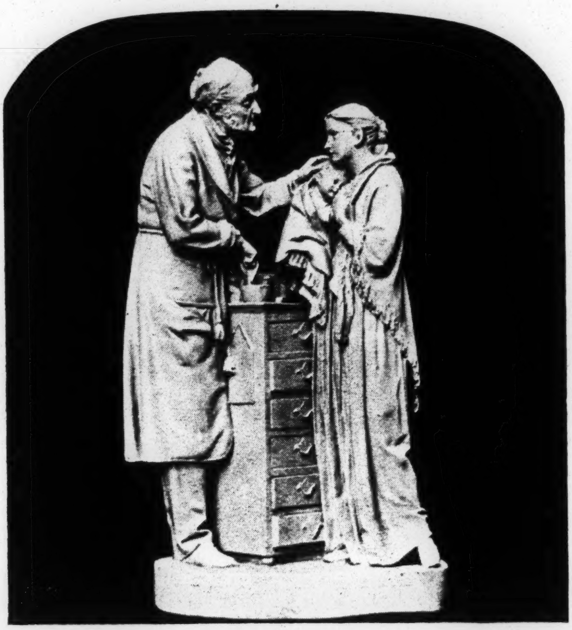


John Rogers Group of Poor Patient and Doctor (1886). Rogers Used Dr. Willard Parker as His Model.

[From Petrus Franciscus Phrygius: Commentarii. Lugduni, 1644.]

ANNALS OF MEDICAL HISTORY
New Series, Volume V September, 1933 Number 5

THE TWO HEBERDENS

WILLIAM HEBERDEN THE ELDER (1710–1801)
WILLIAM HEBERDEN THE YOUNGER (1767–1845)

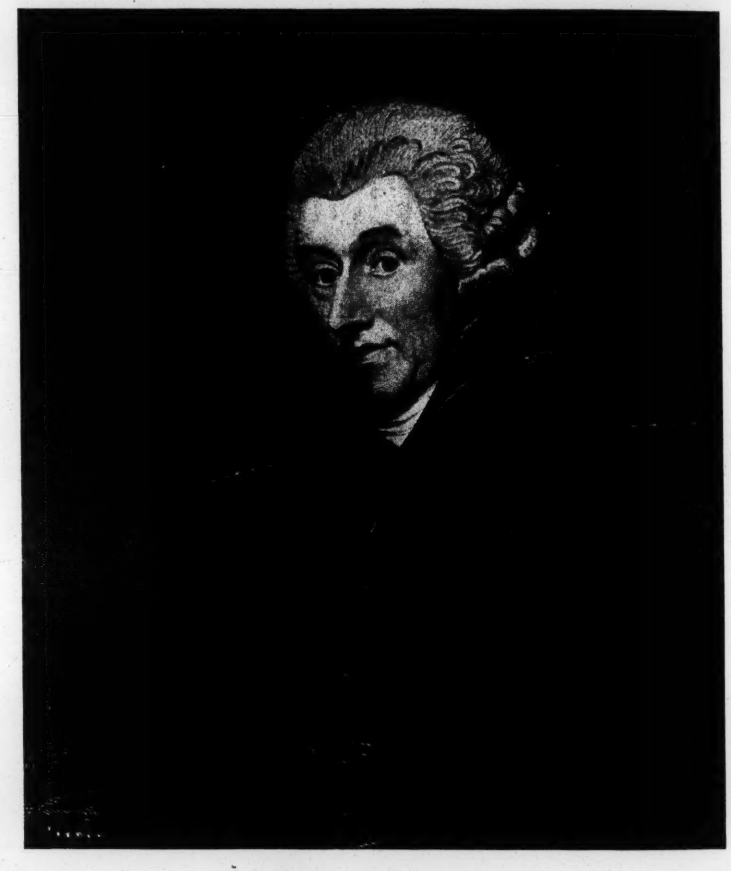
By SIR HUMPHRY ROLLESTON, BART., G.C.V.O., K.C.B., M.D.
HASLEMERE, SURREY, ENGLAND

Part 1

THERE are handicaps as well as advantages in being the son of a man eminent in the same walk of life. Though in the case of the two Pitts the son was the more distinguished, the reverse more usually holds good. While with the help of his father's friends and fame the son is usually assured of a good education and start in life, he is thus deprived of the spur of poverty, may be tempted to rest on the paternal oars, and easily be overshadowed by his father's achievements. The son may be born of a father of more than middle age, as in the case of William Heberden the younger, or in a state of overstrained or impaired health. This might help to explain some lack of vitality and energy in the son of a vigorous and successful father. Exceptionally no doubt, as in the strange case of James and John Lind, father and son may be telescoped into one person; if this has happened in the case of father and son with the same initial though different Christian names there is even more likelihood that it might occur with the two William Heberdens.

WILLIAM HEBERDEN THE ELDER (1710–1801)

William Heberden (or son of Hubert, other forms being Hibberdine and Hubbard) or Hebberden as the name was very occasionally spelt, was such an outstanding character that much has been written about him and numerous references are available in the books of his and later times. The second edition of Macmichael's "Gold-headed Cane" (1828) contains a good deal of information obtained direct from William Heberden the younger; this is largely reproduced in Munk's "Roll of the Royal College of Physicians of London," and in the anonymous "Lives of British Physicians" (1830) with which Macmichael had much to do, though he was not the author of Heberden's memoir. Audley Cecil Buller (1853–1894), educated at Harrow and Trinity College, Cambridge, was a connection of the Heberden family and a younger brother of General Sir Redvers Henry Buller (1839–1908); he thus appropriately won the Wix prize at St. Bartholomew's Hospital, London, with an essay on "The Life and Works of Heberden" in 1878, published in the following year; it contains many family details and a pedigree. A more extensive pedigree will be found in Symons and Sowerby Wallis's "British Rainfall" (1896), and I am indebted to the Rev. E. Buller Heberden of Broadstairs, Kent, for further information on this subject. John Nichols's



William Heberden.

FIG. 1. WILLIAM HEBERDEN, THE ELDER, M.D., F.R.S. (1710–1801).

"Literary Anecdotes of the Eighteenth Century," Sir Robert Scott's "Admissions to the College of St. John the Evangelist," Austin Dobson's charming essay on "An Eighteenth Century Hippocrates," Le Roy Crummer's prefatory note to his publication for the first time of Heberden's "Introduction to the Study of Physic," and the "Dictionary of National Biography" also provide much material. The notice formerly in the "Encyclopaedia Britannica" undeservedly disappeared after the eleventh edition in 1910.

EARLY LIFE AND CAMBRIDGE

His earliest known ancestor is his great-grandfather Edward Heberden of Idsworth Park, near Petersfield, Hampshire, which is said to have been in the possession of the family since the reign of Queen Elizabeth; Thomas Heberden, his grandfather, lived at Chichester, and his father Richard, whose occupation is not known, married Elizabeth Cooper and lived in the parish of St. Saviour's, Southwark, where he died on October 17, 1717. William Heberden was born in Southwark in August, 1710, and was the third of four sons in the family of six. His elder brother Thomas (1703–1769), M.D., F.R.S. (December 10, 1761), went first to Teneriffe and then to Funchal in Madeira, where he died; he contributed five papers, four on meteorological subjects, to the *Philosophical Transactions* of the Royal Society:

(1) "Observations made in going up the Pic of Teneriffe" (*Phil. Trans.*, 47: 353, 1751–2), (2) "Observations of the Weather in Madeira" (47: 357, 1751–2), (3) (48: 617, 1753), and (4) "Observations for settling the Proportion which the Decrease of Heat bears to the Height of Situation" (55: 126, 1765) which were made on the ascent of Pico Ruivo in Teneriffe. He was thus the first of a number of Heberdens who have left evidence of their active interest in meteorology. (5) "Of the Increase and Mortality of the Inhabitants of the Island of Madeira" (57: 461, 1767). The first volume of the *Medical Transactions published by the College of Physicians* (1768) contained his paper "Of the Elephantiasis," and his brother William, who communicated this account of the treatment of leprosy (formerly called elephantiasis Graecorum), added a scholarly note on the introduction of vipers as a drug into the ancient materia medica.

Nothing is known of the other brothers and sisters. William entered the Southwark Grammar School on June 17, 1717; on November 17, 1724, he acted in the representation of Terence's "Phormio," and showed such promise in classics that his mother was persuaded to send him to Cambridge instead of "putting him behind the counter" as had been intended on account of "the somewhat straitened circumstances" of the family. Accordingly he was admitted a sizar of St. John's College on December 23, 1724, his tutor being John Newcome (1684–1768) who was subsequently Lady Margaret Professor of Divinity (1727–1765) and Master of the College (1735–1768). Heberden, it may be mentioned, took an active part in supporting his former tutor at the contested election for the Mastership in 1735. He was the first of his name to be educated at Cambridge, but at Oxford a John Heberden was admitted B.A. in December, 1529. He proceeded to the degree of B.A. as seventeenth in the *Ordo Senioritatis* 1728–9, which in 1748 became the Mathematical Tripos; the first, fourth, sixth, and tenth in the same list were also members of St. John's College. Elected a fellow of the College on April 6, 1731, he was admitted medical fellow July 5, 1734, being thus enabled to hold his fellowship without taking Holy Orders, and was Linacre lecturer in physic from 1734 to 1738. Three of his sons, Thomas (1754–1843), William (1767–1845), and Charles (1772–1796) were subsequently fellows of St. John's College. Becoming M.A. in 1732 he began the study of medicine in Cambridge and is said to have worked also in London, but at what hospital is unknown. At St. George's Hospital, opened in 1733 as an offshoot from the Westminster Infirmary, his son William, his grandson Henry (1802–1828) who died of pyemia from a postmortem wound, Thomas Heberden (1802–1877) D.M. Oxon, F.R.C.P., and other descendants were students; but the record of the students does not go back so far as the time he might have worked there. He proceeded to the degree of M.D. in 1739, and practised his profession at Cambridge until the end of 1748 when he migrated to London. In 1741 he wrote a "Dissertation to show that the *Δάφνη* of the Greeks was the Laurocerasus of the Romans or our Laurel and not the Bay Tree," a copy of which by John Ward (?1679–1758), Professor of Rhetoric at Gresham College, is, together with a letter to Richard Mead dated December 16, 1741, in the British Museum (Addit. MS. 6269). While in Cambridge he delivered an annual course of lectures on materia medica; they were never printed in entirety, but a manuscript copy of 29 lectures was formerly in the possession of T. J. Pettigrew (1791–1865) who gave extracts from them in his "Memoir" of Heberden and wrote: "Homer, Plautus, Plutarch, Vitruvius, Vergil, Horace, Lucretius, Cicero, Ovid, Persius, Lucan, Catullus, Juvenal, and Pliny are all made to illustrate and adorn his discourses." The substance of one of these lectures is said to have formed his printed but not published "’Αντιθηριακά: an Essay on Mithridatium and Theriaca" (4to. Cambridge, 1745). In this pamphlet of 19 pages he pointed out that the ancients were acquainted with very few poisons: hemlock, monk's hood, and those of venomous animals, and did not possess any antidotes to them; the antidote found in the cabinet of Mithridates Eupator the Great (B.C. 133–63), King of Pontus, was a very simple remedy, namely a mixture of twenty leaves of rue, one grain of salt, and two dried figs, and could not have antagonized a vigorous poison; so that if Mithridates ever used it (which is doubtful) his failure to poison himself must have been due to the feeble character of the poison rather than to the virtue of the antidote. There was "some reason to suspect that Mithridates was as much a stranger to his own antidotes, as several eminent physicians have since been to the medicines that are daily advertised under their names." Further, the famous Mithridatium, which in the time of Celsus consisted of 38 simples, had changed its composition every hundred years and thus become quite different from the original. Andromachus, physician to Nero, added vipers and increased the amount of opium, and in Trajan's time it was called theriaca. Heberden's independent and vigorous protest against this farrago, as he called it, did not have any immediate influence on the Royal College of Physicians of London, for it was not until 1788 that their pharmacopeia was purged of this ancient relic of superstitious polypharmacy. In 1750 the collection of specimens illustrating his lectures was presented to St. John's College, which in 1767 also received from him a valuable set of astronomical instruments for the College observatory, situated over the arch (the Shrewsbury tower) between the second and third courts. Among his pupils at Cambridge were Sir George Baker (1722–1809), who proved that Devonshire colic and colica Pictonum (of Poitou) were forms of lead poisoning, and Thomas Gisborne (1726–1806), both subsequently presidents of the Royal College of Physicians of London, and Robert Glynn, later Clobury (1719–1800), who declined the Regius Professorship of Physic in 1798 when offered it by William Pitt (1759–1806), when Prime Minister, who in 1773, when at Pembroke Hall, had been his patient.

With a high reputation for classical scholarship Heberden contributed Letter CXXXI to Volume 2 of "The Athenian Letters: or the Epistolary Correspondence of an Agent to the King of Persia residing at Athens during the Peloponnesian War" (London, 1741–3, 8vo, 4 vols.). This work purported to be a translation from a manuscript in the old Persian language in the library at Fez. Heberden wrote "A Letter from Cleander to Alexias on Hippocrates and the State of Physic in Greece." These letters were written by members of a literary circle collected around the Hardwick family; most of them were Cambridge contemporaries, and were described in the preface to the edition of 1781 as "an Ornament to the place." The original edition was limited to twelve copies, and that of 1781 to a hundred, but subsequent editions appeared in 1792, 1798, and 1810.

The other authors of these letters were Philip York (1720–1790) afterwards second Earl of Hardwick, his brother Charles (1722–1770) afterwards Lord Chancellor and F.R.S., who between them wrote a large number of the letters, John Green (? 1701–1779) Bishop of Lincoln (1761–1779), Daniel Wray (1701–1783) one of those supposed to have been the author of "The Letters of Junius" (1770), Rev. J. Heaton of Corpus Christi College, Henry Coventry (obiit 1752) fellow of Magdalene College, John Lawry, Prebendary of Rochester, Catherine Talbot (1721–1770), authoress and friend of Elizabeth Carter of the "Bas Bleu" Society, Thomas Birch (1705–1766) historian and biographer, patronized by the Hardwick family, but not a Cambridge graduate, and Samuel Salter (ob. 1778) fellow of Corpus Christi College (1735) and Master of the Charterhouse, London.

In 1744 Zachary Grey (1688–1766) brought out an edition of Samuel Butler's "Hudibras" "with large annotations" and in the preface acknowledged the help given by Heberden.

Among Heberden's Cambridge friends were Conyers Middleton (1688–1750) and the scholarly recluse Jeremiah Markland (1693–1776) fellow of Peterhouse, who criticized Middleton's "History of the Life of Cicero" (1741). Heberden showed his friendship and love for "the old humanities" by meeting the expenses of publishing Markland's annotated editions of three plays of Euripides, the "Supplices Mulieres" in 1763 and the "Iphigenia in Aulide" and "Iphigenia in Tauride" in 1771. He also wrote the inscription for the votive brass, which he recommended rather than the marble tablet previously proposed, to Markland's memory in St. Martin's Church, Dorking. Markland left all his books and papers to Heberden; among them was a folio copy of John Mill's (1645–1707) edition of the New Testament in Greek with marginal notes; this was lent to the publisher of the 3rd edition (1782) of "The Critical Conjectures and Observations on the New Testament," written by William Bowyer, the younger (1699–1777), "the learned printer." In his "advertisement" the publisher wrote: "For this invaluable acquisition the reader is indebted to that liberal attention to promote the cause of Virtue and Religion which is one of the well known excellencies of Dr. Heberden." Bowyer bequeathed to Heberden "his little cabinet of coins, a few books specifically and any others which the Doctor might chuse to accept." Heberden generously assisted the Dutch philologist H. Hoogeveen (1712–1791) in the publication of his "Doctrina Particularum Linguae Græcae" (1769). Among his other literary friends were Thomas Tyrwhitt (1730–1786), the editor of Chaucer's "Canterbury Tales," Jacob Bryant (1715–1804), author of "Ancient Mythology" (1774–6), William Warburton (1698–1779) Bishop of Gloucester, and Thomas Gray, the poet. Some were also his patients; in his last illness in 1783–4 Samuel Johnson sent for him as "Ultimus Romanorum, the last of our learned physicians," and later rebuked him for what was probably but wise caution rather than, as it seemed to Johnson, anxiety about his professional reputation by calling him "timidorum timidissimus"; Samuel Richardson, the novelist, left a ring to "the kind Dr. Heberden." George Crabbe (1754–1834), poet, medical man, and cleric, who suffered much in health, spoke of him as "tender and ardent, with the kindest air" in the sick-room. William Cowper, the poet, expressed his gratitude in "Retirement" (1781):

> Virtuous and faithful Heberden, whose skill
> Attempts no task it cannot well fulfil,
> Gives melancholy up to Nature's care
> And sends the patient into purer air.

This indeed corresponds with Heberden's conclusion in his commentaries about hemoptysis, a condition very different from Cowper's mental disorder: "The best remedies seem to be a cool air; quiet; a very sparing mild nourishment, administered in small quantities at a time." A tribute to his abilities as a Hebrew scholar was paid by William Newcome (1720–1800), Bishop of Waterford and afterwards Archbishop of Armagh, in his "Attempt towards an improved Version, a Metrical Arrangement, and an Explanation of the twelve minor Prophets" (1785); in connection with Haggai II, 3, 7, 8, 9, he wrote: "after I had finished these notes, as to their sense and substance, I received the following valuable communication from the learned and respectable Dr. Heberden, which will give the reader great assistance in determining the sense of the prophecy now under discussion." In 1747 when George Ashby (1724–1808), the antiquary and Linacre lecturer in Physic (1763–7) though not a medical man, was a candidate for a fellowship at St. John's College, Cambridge, Heberden examined him in the Hebrew psalms.

Another Cambridge friend, the Rev. William Cole (1714–1782), the antiquary, had a good deal to say about

Heberden in his Collections for an "Athenae Cantabrigienses" (Brit. Museum, Addl. MSS. 5871). These two very often spent the evenings with Conyers Middleton, D.D., who was Protobibliothecarius (1721–1750), an office ranking above the Bibliothecarius and specially created for Middleton, but continued until 1828 when the two offices were vested in the same person. Middleton was also the first Woodwardian Professor of Geology (1731–1734) at Cambridge and an unorthodox divine who disputed the credibility of miracles. The following incident bears on Middleton's views and Heberden's generosity. After Middleton's death his third wife consulted Heberden about the publication of a manuscript of her husband on "The Inefficacy of Prayer"; after reading it he told her that though the work might be deemed worthy of her husband's learning it would be injurious to his reputation, but as the matter was pressing he would find out what a publisher might be disposed to give for the copyright. This proved to be £150, and accordingly Heberden paid the widow £200 and consigned the manuscript to the flames. Middleton's manuscripts were left by his widow to Heberden who in 1761 "obliged the learned world with" the publication of a Harleian manuscript about thirty-four years old, intended to be the last word in one of Middleton's many literary battles. The circumstances were as follows: in his Harveian Oration on October 18, 1723, Richard Mead (1673–1754) defended the position of physicians in Greece and Rome, arguing that they were always honored in society and often wealthy, and was supported in an appendix to the Oration provided by Edmund Chishull (1671–1733) divine and antiquary, "Dissertatio de nummis quibusdam a Smyrnaeis in Medicorum Honorem percussis." Middleton in "De Medicorum apud veteres Romanos Degentium Conditione Dissertatio," (4to. Cantab.) attacked the conclusions of the Harveian Orator and Jacques Spons (Sponius, 1647–1685) and described the medical men in Rome as slaves. He was answered in the same year by John Ward (? 1679–1758), the biographer of the Gresham professors and vice-president of the Royal Society, and by Joseph Letherland (1699–1764), a medical friend of Heberden, "In Dissertationem nuper editam de Medicorum apud Romanos Degentium Conditione Animadversio brevis" (40 pp. Lond., 1727), and by others. Middleton countered with "Dissertationis . . . contra anonymos quosdam . . . Auctores Defensio," in 1727, and further wrote "Dissertationis de servili Medicorum Conditione Appendix seu Definitiones Pars secunda cui accedit ad Dominum Lamotte Epistola apologectica Anglice Conscripta." Charles Lamotte, it should be mentioned, had written in February 1726–7 an "Essay upon the State and Condition of Physicians among the Ancients, occasioned by a late Dissertation of the Rev. Dr. Middleton." Middleton, however, suppressed his counterblast after meeting Mead in a friendly way at the Earl of Oxford's house. To this "dissertation" Heberden appended "a short but elegant advertisement of his own" (*Gentleman's Magazine*, 81: part 1, 555, 1801) which explained why Middleton had not published it in 1727.

Before he left Cambridge Heberden, according to Cole,

> . . . was very desirous of marrying a daughter of Dr. Clark, Dean of Salisbury,

who lived in a house opposite St. Clement's Church; but she did not accord and married a physician of Salisbury, Dr. (John) Jacob (obiit 1789), formerly a fellow of King's College, a younger man and better person; although Dr. Heberden, a tall, thin, spare man, was perfectly well made, and of a florid, good countenance, short-sighted. I thought it remarkable that he should ever establish himself in London, because whenever he had occasion to go thither from Cambridge, as he had frequent calls of that sort, I have heard him say often and often that the air was so dissimilar to his constitution and lungs that he could never sleep there, but always lodged at some miles distant. Great genii deal often in paradoxes. He soon reconciled him to an air that so amply filled his pockets.

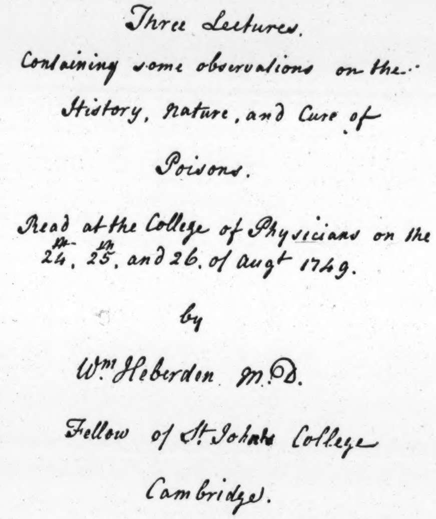
It is conceivable that Heberden's opinion of London may have been known to others besides Cole and thus explain or to some extent mitigate the otherwise unpleasant significance of a subsequent incident mentioned below. Elsewhere Cole wrote of Heberden: "he was the thinnest person I ever saw, very tall, a most clear and healthy countenance. . . . The Doctor is a great Whig and Wilkite, and advocate for the petitioning clergy, unbecoming a man of moderation." Cole appears to have had an eye for absence of rotundity for in 1770 he wrote of Charles Collignon (1725–1785), Professor of Anatomy (1753–1785) at Cambridge, as the most suitable person possible for his professorial duties "as he is a perfect skeleton himself, absolutely a walking skeleton, nothing but skin and bone."

On June 25, 1745, Heberden was admitted a "candidate" and on the same day in the following year a fellow of the Royal College of Physicians of London. About Christmas, 1748 he left Cambridge for London on the advice of Sir Edward Hulse (1682–1759), physician-in-ordinary to Queen Anne, George I and George II, and though not the first medical man to be created a baronet was the earliest of that order whose descendants still carry on the title. From the correspondence given in "The Gold-headed Cane" (Ed. 2, pp. 170–3, 1828) it appears that Sir Edward had previously made an attempt to invite Heberden to practice in London by sending him a message through a medical friend who, however, not only did not convey the message but informed Sir Edward that Heberden was not inclined to leave Cambridge. The name of the failing friend is not known, as it was effectively erased from the letter in which it occurs, and it is said that Heberden subsequently lived on friendly terms with him. It is possible that the friend had heard reports of Heberden's dislike of London air as voiced by Cole and felt justified in reporting on this second-hand information. Hearing after an interval of this intended overture, Heberden wrote to Sir Edward and then received a reply urging him to take this opportunity of starting practice in London as being particularly favorable, because Dr. Peter Shaw (1694–1763), a most prolific author, who by Sir Edward's help was in very busy practice, had gone to Hanover with the Duchess of Newcastle. Cole remarked "it was no small piece of good fortune to the Physic Professor Dr. Russell Plumptre (1709–1793) who was neither liked nor had such practice, that Dr. Heberden's great character called him to London, where he had the greatest success and practice." In the light of the stagnation during and for some time after Plumptre's long tenure (from 1741 to 1793) of the Regius Chair it is a matter for regret that Heberden was not elected instead, for he might have brought about a new birth of medicine in Cambridge more than a century before it actually did take place.

Life in London

Heberden, who settled in Cecil Street, Strand, about Christmas, 1748, gave the Goulstonian lectures at the Royal College of Physicians in London in August, 1749; and as a manuscript copy of these lectures which appears to be very probably in his handwriting has come into my hands, the following digression on these unpublished lectures may perhaps be justifiable.

Manuscripts of the Unpublished Goulstonian Lectures. After quoting Samuel Johnson's description of William Heberden as "Ultimus Romanorum, the last of our learned physicians," J. F. Payne added "but he might almost as well have been called the first of the moderns." He, however, was characterized by a trait more frequent in those days than in these hurried times, namely a reluctance to publish what he had committed to paper. His "Commentarii de Morborum Historia et Curatione" were completed in 1782 but were addressed to any of his sons who might follow the same profession, and first appeared in print in 1802, after his death; his Goulstonian (1749) and Croonian (1760) lectures and Harveian Oration (1750) were never published. But this is not all, for Le Roy Crummer picked up in a second-hand book shop in "the south of London" a manuscript, ascribed to Heberden, of an unpublished "Introduction to the Study of Physic," which he had printed in 1928–9 for the first time.



Three Lectures.
Containing some observations on the
History, nature, and Cure of
Poisons.

Read at the College of Physicians on the
24th. 25th. and 26. of Augt 1749.

by

Wm Heberden M.D.

Fellow of St Johns College
Cambridge.

Fig. 2. Title-page of Unpublished Goulstonian Lectures by William Heberden the Elder.

Thirty years previously Norman Moore (1847–1922) gave an account of the notes taken by Erasmus Darwin (1731–1802) of Heberden's lectures, and it is clear that the material is much the same as that in the recently discovered "Introduction." Le Roy Crummer, who considers that this manuscript dates from about 1750, quotes from another Heberden manuscript, which he has also presented to the Royal College of Physicians of London, to explain Heberden's modest attitude towards publication of his own writings. This collection of essays contains one "Upon Composition, Authors, and their Works in general, either of Genius or Science" from which the following extracts are taken: "The exercise of composition opens and enlarges the mind and improves the taste": this is a good and sufficient reason for writing, but for that only; that "commonly, a man who has already established a reputation, loses it as soon as he ventures to give anything to the public" is a wise warning why not to broadcast, and may perhaps be regarded as a cautious expression of agreement with the cry of Job (xxxi, 35) "My desire is that . . . mine adversary had written a book." Heberden's dictum "if men of letters could be obliged to write always with a view to publishing, though without ever doing so, they would be perhaps the happiest of men" probably represents the philosophical conclusion of his long experience.

Several manuscript copies of the Goulstonian lectures exist, but of the Croonian lectures and the Harveian Oration none is known and even their titles are lost to memory. The manuscript copies of the "Three Lectures containing some Observations on the History, Nature and Cure of Poisons, read at the College of Physicians on the 24th, 25th and 26th of August 1749" may reasonably, though the title page does not say so, be accepted as the Goulstonian lectures, for Heberden gave these lectures in that year, and the Annals of the College state that "on August 24, 25, 26, Doctor William Heberden read the Goulstonian Lectures." Neither the Annals nor Munk's "Roll of the Royal College of Physicians of London" records the title of the lectures. In addition to his general reluctance in this respect there is another possible reason why the Goulstonian lectures were never published. When he moved to London at the end of 1748 he was appointed to the lectureship and in these circumstances may have found it convenient to deal in the lectures with ideas somewhat on the same lines as those contained in his first printed work, 'Αντιθηριακά: An Essay on Mithridatium and Theriaca (1745), and therefore thought it unnecessary to publish the new text. The first lecture dealt with what he called "the fabulous age of poisons," but does not repeat what he had previously written about the Mithridatium. He recorded some experiments which he carried out on dogs with the poison of Indian darts, and admitted their efficacy. In the second and third lectures he discussed more modern poisons and their action on the nervous system. Very probably the fact that the lectures were not published may explain the existence of several manuscript copies of the lectures on "The History, Nature, and Cure of Poisons," thus recalling the manuscript copies of Sir Thomas Browne's "Religio Medici" in circulation before its publication. Heberden, as his remarks "Upon Composition" and his habit of constant note-taking prove, was a very diligent writer and must have enjoyed the intellectual exercise. Le Roy Crummer's analysis of his Heberden manuscripts and the two volumes (*vide* Pt. II) connected with the "Commentaries" in the Library of the Royal College of Physicians of London make it extremely probable that he also made several drafts of the Goulstonian lectures. The following manuscript copies of his Goulstonian lectures are known, more than one of which may possibly be in his handwriting:

(1) In the library of the Royal College of Physicians of London. A small 4to, pp. 100. At the end of the lectures there are some pages of notes in quite another handwriting. Dr. Arnold Chaplin, the Harveian Librarian from 1918, bought it for eighteen shillings in the Minories in December, 1916, and presented it to the College. He believes that it is in Heberden's handwriting. This is the copy described by Le Roy Crummer as pur-

chased from the executors of Dr. W. Munk.

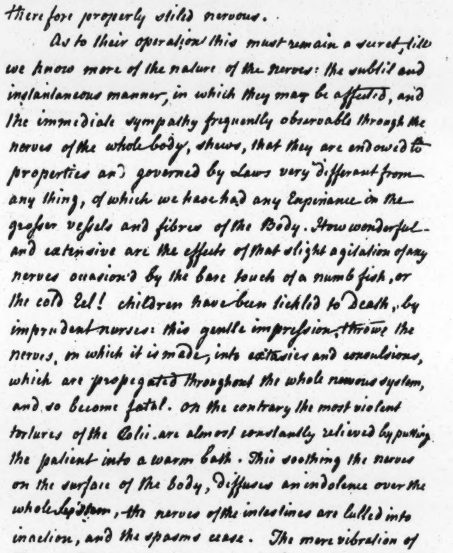
(2) In the library of the Royal College of Physicians of London. A copy made from the manuscript (No. 4) in the library of Queens' College, Cambridge. Folio, old calf, 68 leaves, in a nineteenth century hand. It contains the book-plate, and is assumed to be in the handwriting, of Thomas Harrison, B.A. (1793), Fellow and Librarian of Queens' College, Deputy High Steward of the University (1806–1824) and Commissary (or a judge) in the Chancellor's Court (1814–1824), Cambridge. It was purchased in September, 1899 from the executors of W. Munk (1816–1898), Harveian Librarian (1857–1898). In Le Roy Crummer's book it is described as presented by Dr. Arnold Chaplin.

(3) In the library of the Royal College of Physicians of London. 90 pages, small 4to, half calf; in an eighteenth century hand. Inside the front cover are the inscriptions: "Rich$^{\underline{d}}$ Wright, November 10$^{\underline{th}}$ 1811," and "W$^{\underline{m}}$ Hammond ex dono Gulielmi Salt, V.D.M. die Jovis 21 Febrii, 1828." Given or sold to the College by Mrs. Alfred Jones, of Southbourne-on-Sea, at the instance of Sir Alfred B. Garrod.

(4) In the library of Queens' College, Cambridge. A copy in the best professional copyist handwriting. Folio, half calf paper, pp. 69. It is in T. H. Horne's printed catalogue of the College Library 1827, and is now numbered "Manuscripts p. 1003." It has the 1700 book-plate of the College, which was used from 1700 to 1800.

(5) In the library of St. John's College, Cambridge. 4to, paper, 83 pp. According to the librarian, Dr. C. W. Previté-Orton, F.B.A. it is in a professional copyist's hand, and has been in the library since the middle of the eighteenth century. Classmark N22.

(6) Mr. R. R. James, my former colleague as ophthalmic surgeon at St. George's Hospital, most generously gave me a manuscript copy of these three lectures on poisons. It was bought in the autumn of 1931 at the sale of the effects of the late Miss Anne Ellen Prince (1841–1931) of 4 Durham Villas, Kensington, W. 8, who was the daughter of Thomas Prince, a medical practitioner of Balsham, near Cambridge. Dr. W. M. Palmer of Linton, near Cambridge, who has written on "Cambridgeshire Doctors in the Olden Time, 1466–1827" tells me that there were several generations of the Prince family in practice at Balsham and Sawston, near Cambridge, and that one of them had a large practice and consulting rooms at Newmarket and perhaps at Cambridge. This may have been the T. Prince, whose name with "Cambridge 1779" appears on the fly-leaf of the manuscript, and a descendant of his may have been the "Thomas Prince, Balsham, 1844" whose signature is inserted later in the manuscript.



therefore properly stiled nervous.
As to their operation this must remain a secret, till
we know more of the nature of the nerves: the subtil and
instantaneous manner, in which they may be affected, and
the immediate sympathy frequently observable through the
nerves of the whole body, shews, that they are endowed to
properties and governed by Laws very different from
any thing, of which we have had any Experiance in the
groſser veſsels and fibres of the Body. How wonderful-
and extensive are the effects of that slight agitation of any
nerves occasion'd by the bare touch of a numb fish, or
the cold Eel! children have been tickled to Death, by
imprudent nurses: this gentle impreſsion, throws the
nerves, on which it is made, into extasies and convulsions,
which are propagated throughout the whole nervous system,
and so become fatal. On the contrary the most violent
tortures of the Colic. are almost constantly relieved by putting
the patient into a warm bath. This soothing the nerves
on the surface of the body, diffuses an indolence over the
whole system, the nerves of the intestines are lulled into
inaction, and the spasms cease. The mere vibration of

FIG. 3. PAGE FROM THE MS OF GOULSTONIAN LECTURES, SHOWING RESEMBLANCE TO HEBERDEN'S SCRIPT.

The manuscript obtained at the sale of Miss A. E. Prince's effects is a quarto with marbled paper covers, a leather back, and 76 pages of text of the lectures. It is in two different handwritings; the first two lectures and the first three pages of the third lecture are in a script resembling that of Heberden (*vide* Fig. 2), and Mr. H. M. Barlow, Secretary of the Royal College of Physicians of London considered that it was Heberden's. Most of the third lecture, namely the last 20 pages, is in a different script. As compared with the copy in St. John's College Library the last 14 pages of the third lecture are missing, the text ending in the middle of a sentence. The back of this page bears the words "Thomas Prince, Balsham, 1844," and the following pages contain various medical notes, beginning with "Graves on Fever"; (R. J. Graves, whose Clinical Lectures were published in 1843, suggested for his own epitaph "He fed fevers"). There are also some old and faded memoranda for medical attendance pasted into the volume.

The interesting question whether or not the first two lectures and the first three pages of the third lecture are in Heberden's own handwriting is one for decision by experts. Mr. H. M. Barlow's opinion has already been quoted, and Mr. H. L. Pink, Superintendent of the Reading Room of the University Library, Cambridge, has kindly supplied the following statement, which is confirmed by Mr. E. J. Thomas, the senior Under-Librarian:

> The first fifty-six leaves of the Manuscript of "Three Lectures containing some observations on the History, Nature, and Cure of Poisons . . . " is written in a hand which corresponds with the facsimiles of Dr. Heberden's writing on pp. 5 and 8 of "An Introduction to the Study of Physic" (New York, 1929). There is nothing definite to indicate that the two hands are different; but there is not enough of the facsimiles to make it possible to assert their identity without reserve. The writing is certainly not that of T. Prince. The signature on the fly-leaf must certainly be by T. Prince and this makes it certain that the two receipts are wholly in the writing of T. Prince. It is also very probable that the portion following the lectures beginning "Graves on Fever" is in the hand of T. Prince. It is impossible to say anything about the identity of the writing of the end of the third Lecture, ff. 57–77.

Inquiries show that there is not any manuscript of these lectures in the Libraries of the British Museum, the Royal College of Surgeons of England, The Royal Society of Medicine, of the University, and Trinity and Corpus Christi Colleges, Cambridge, or Trinity College, Dublin. This manuscript of the Goulstonian lectures has after consultation with Mr. R. R. James been presented to the library of the Royal College of Surgeons of England.

Heberden's Activities at the Royal Society. On January 25, 1749–50 (N.S. 1750), for until 1752 the year began on March 25, he was elected a fellow of the Royal Society. On the same day was elected Nathan Alcock (1707–1779), the date of whose birth and to some extent his circumstances at Oxford resembled those of Heberden; he lectured unofficially at Oxford on anatomy, chemistry, and physic from 1738 when the official teachers, such as William Woodford, the Regius Professor (1730–1759), who treated their duties as sinecures, were thus stirred to active though futile opposition by his overwhelming success. He had been a pupil of Boerhaave at Leyden and thus differed from Heberden who never visited any foreign clinic. Anthony Askew (1722–1774), who was elected to the fellowship a week after Heberden and Alcock, shared the advantages of Cambridge and high classical abilities with Heberden and of Boerhaave's teaching with Alcock.

The *Philosophical Transactions of the Royal Society* contain the following contributions from Heberden:

(1) "An Account of a very large human Calculus, preserved in the Library of Trinity College, Cambridge" (*Phil. Trans.*, 46: 596, 1750. This monstrous oval stone, which had been eighty years in the library at the time it was described, was found after death in the urinary bladder of the wife of a locksmith at Bury. It weighed 33 ounces, 3 drachms, and 36 grains, and a piece (about ¼ oz.) had been chipped off to instruct Charles II in the formation of calculi when it was shown to him at Newmarket. It measured 3¾ inches in length and had a maximum circumference of 4¾ inches. Heberden quoted a urinary calculus in Paris of about the same weight, and referred to the calculus weighing 51 ounces found in a monk, mentioned by Martin Lister. The calculus is not now in the library of Trinity College, Cambridge. Mr. H. M. Adams, the librarian, has kindly informed me that some years ago all the objects in the library not of direct library interest were moved to the museums, anatomical, ethnological, or of classical archeology. This calculus was transferred to the Humphry Pathological Museum.

(2) "An Account of the Effects of Lightning at South Weald in Essex" (54: 198, 1764). A widespread storm on June 16, 1764, was described by others in the same volume, and "Dr." Wilson, probably Benjamin Wilson (1721–1788), (p. 247) like Heberden drew attention to the value of Benjamin Franklin's suggestion that any building can be protected from the damage that otherwise may be done by lightning, by running metallic lightning conductors from the roof into the earth. This paper was reprinted nearly eighty years later in Sturgeon's *Annals of Electricity* (10: 9–10, 1843).

(3) "Of a Salt found on the Peak of Teneriffe" (55: 57, 1765). Thomas Heberden sent over some saltpetre found near the edge of a crater, which was analyzed by Henry Cavendish and described and discussed by William Heberden.

(4) "An Account of a Stone voided without help from the Bladder of a Woman at Bury" (55: 128, 1765). This oval calculus, of which an illustration is given, weighed 2 ounces, 2 drachms, and 24 grains, and measured 3¾ inches in length and 4¾ inches in circumference. The patient, a woman aged sixty-seven years, was so poor that she could not obtain medical assistance in the severe attack of cystitis which accompanied the passage of the calculus. Heberden refers to a somewhat similar case. In the section on "calculus urinae" in the "Commentaries": "I saw a stone voided by a woman, of an oval form, whose larger circumference was six inches, and the less four inches. She was delivered of a child the next day with less pain than she had felt in parting with the stone." Formerly urinary calculi were commoner in the eastern counties than elsewhere in Great Britain; in 1820 R. Smith estimated that there were as many cases in the Norfolk and Norwich Hospital as in either Scotland or Ireland, and ten years later Yelloly calculated that in Norfolk 1 out of every 34,000 persons suffered from stone as compared with 1 out of 108,000 persons in the rest of England and Wales. The prominence of urinary calculi in the eastern counties of England does not now hold good.

(5) "Of the different Quantities of Rain which may appear to fall at different Heights, over the same spot of Ground. Observations taken from 7 July 1766 to 7 July 1777" (59: 359, 1769). These observations were made with rain-gauges of exactly the same form placed (a) at the

top of his house, (b) at a lower level at the same site, and (c) on the roof of Westminster Abbey. It appeared that at the lower level about one-fifth more rain fell than at the top of the house and about twice that on the roof of Westminster Abbey. He suggested that this phenomenon was connected with "some hitherto unknown property of electricity." This paper, read on December 7, 1769, was reprinted in "British Rainfall," 1897, by G. J. Symons and H. Sowerby Wallis, who refer to this as the first observation that the amount of rain collected above the ground is less than that collected on the ground.

(6) "Table of the mean Heat of the different Months in London" (78: 86, 1778). The average temperature was 50.6°F.

Residences in London and Marriages. Heberden, as already mentioned, settled in Cecil Street, Strand, and, to quote from his son's short biographical notice in the English edition of the "Commentaries on the History and Cure of Diseases" (1802), "very soon got into great business, which he followed with unremitting attention above thirty years." It is rather remarkable that with all the qualities and aptitude for such a post he was never physician to one of the comparatively few existing hospitals or a dispensary in London; he, however, appears to have seen cases in hospitals, for he refers to one at St. Thomas's. He continued to live in Cecil Street until at least 1770, as is shown by a letter, dated November 3 of that year, to John Hunter, reproduced in facsimile by Le Roy Crummer; but exactly when be bought from the Waldegrave family the site "on the sweet shady side" of Pall Mall, given to Nell Gwyn by Charles II, is not known. His house, 79 Pall Mall, was sold to the Society for the Propagation of the Gospel, and in 1867 was bought by the Eagle Insurance Company, which erected a new building now occupied by the Eagle, Star and British Dominions Insurance Company. In 1752 Heberden was called in to consultation over the fourth Duke of Leeds by the famous Richard Mead whose failing faculties were so obvious that his junior colleague at once made up his mind to retire before he should reach that stage; this indeed he began to do about thirty years later, when in his seventy-third year, by living at Datchet, near Windsor, for the summer months, but continuing to practice during the winter in London. In a recently published letter to Mrs. Thrale, Samuel Johnson wrote on September 23, 1783, "I have written likewise to Dr. Heberden who is now in his retreat at Windsor." Munk stated that Heberden did not at once succeed in practice and indeed "was on the point of returning to end his days at Cambridge"; this may explain why at first he went to practice at Scarborough for the summer months. It was not unusual for London physicians of a former age to move to spas and health resorts during the summer season; thus at a later date the great Thomas Young (1773–1829) went regularly for sixteen years (1804–1820) to Worthing for the months of July, August, and September.

On June 1, 1752, the year in which he obtained a grant of arms, Heberden married Elizabeth (1728–1754) daughter of John Martin (1692–1761) of Overbury, Worcestershire, M.P. for Tewkesbury and banker of Lombard Street, whose brother lived at Quy, close to Cambridge. Of this marriage there were two sons: John who died in infancy, and Thomas (1754–1843) Canon Residentiary of Exeter, and the ancestor of the elder branch of the Heberden family which became connected by marriage with the Bullers of Downes, near Crediton, Co. Devon, an old West of England family. A descendant of this branch, the much beloved Charles Buller Heberden (1849–1921) was Principal of Brasenose College, Oxford, from October 1, 1889, to July, 1920. He was the son of the Rev. William Heberden (1804–1890) Vicar of Broadhembury, near Honiton, Devon.

William Heberden's first wife died in 1754 after the birth of her second son. Six years later he married Mary, eldest daughter of Francis Wollaston* the elder (1694–1774) of Charterhouse Square; Cole refers to her reputation as "learned." Of this marriage there were five sons and three daughters, of whom two only survived him: Mary, who figures in 1787 in Fanny Burney's Diary, married in 1788 the Rev. G. Leonard Jenyns, Prebendary of Ely, and had a son, the Rev. Leonard Jenyns (1800–1894) born on May 8, 1800 at Heberden's house in Pall Mall, who afterwards changed his name to Blomefield and in the long period between 1829 and 1887 wrote numerous papers on meteorology, thus carrying on the hereditary activity of his mother's family in this science. The other surviving child of William Heberden's second marriage was William (*vide* Pt. II). William Heberden the elder and his eldest son Thomas (1754–1843) both married twice and into the same families, Wollastons and Martins. Thomas married in 1784 his cousin Althea Hyde (ob. October 6, 1786) second daughter of the Rev. Francis Wollaston (1731–1815), and a sister of William Hyde Wollaston (1766–1828), chemist, physiologist and physician. In 1794 Thomas married as his second wife his cousin Mary (1763–1849) the second daughter of Joseph Martin, M.P. for Tewkesbury and son of John Martin (1692–1767).

The Franklin-Heberden Pamphlet on Inoculation. In 1759 a pamphlet, now extremely rare, appeared with the title "Some Account of the Success of Inoculation for the Small Pox in England and America, together with plain Instructions by which any Person may be enabled to perform the Operation and conduct the Patient through the Distemper." It consisted of two parts; the first dealt with the success of inoculation, and was by Benjamin Franklin (1706–1780) of Philadelphia who, writing from London on February 16, 1759, said that he did so by the desire of his "greatly esteemed friend, Dr. William Heberden, F.R.S., one of the principal physicians of this City." Heberden was responsible both for the text and for the expense of printing the "plain Instructions" for distribution in America; H. K. Cushing, who reproduced the text of the pamphlet, quotes alternative figures of a few hundreds and five thousand as the number of copies printed. Roddis in 1930 also reproduced the Franklin-Heberden pamphlet. Inoculation, long employed in the far east, was brought to the notice of the medical profession in Great Britain by Emanuel Timonius, a Greek, in 1714, and Peter Kennedy, a Scot, in 1715, but was hardly employed until 1721, and then as the result of the influence of Lady

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[*] This is from the *Gentleman's Magazine,* 30: 46, 1760; A. C. Buller and Munk's "Roll of the Royal College of Physicians" give the name as William Wollaston. In the pedigree in Symons and Sowerby Wallis's "Rainfall" the name of Francis Wollaston appears.

Mary Wortley Montagu (1689–1762) who had returned from Constantinople with experience of its application. After some years its use dwindled, but in 1740 it was revived, and in 1754 was approved by the Royal College of Physicians of London.

Professional Activities. George III had a high opinion of Heberden and in 1761 after his accession to the throne wished to appoint him physician to Queen Charlotte; but this honor Heberden was anxious to avoid on account of his extensive practice and succeeded not only in doing so but in securing the appointment for Joseph Letherland (1699–1764), a retiring but very learned man who is said to have "contributed by his literary information to the popularity of more than one of his colleagues," much of John Fothergill's "Account of the Putrid Sore Throat" (1748) being generally allowed to have had this origin.

Heberden, described as a "Wilkite" by Cole (vide p. 416), was mixed up with the turbulent John Wilkes' contests with the House of Commons in 1763–4. Number 45 of *The North Briton* issued on April 23, 1763, was eventually declared to be a seditious libel by both Houses of Parliament, and directed to be burned by the common hangman. In a duel with Samuel Martin on November 16, 1763, Wilkes received an abdominal wound and was attended by a military surgeon called Graves and by Richard Brocklesby (1722–1797) who was, like Heberden, prominent at the Royal College of Physicians and a medical friend of Samuel Johnson, and in 1758 was appointed physician to the Army, serving for some time in Germany during the Seven Years' War. Wilkes thus avoided appearance to a citation by the House of Commons, and on December 16, 1763, the House of Commons ordered Heberden and Caesar Hawkins (1711–1786), Serjeant-Surgeon to the King, to attend Wilkes. Accordingly on December 16 Heberden sent a request for a consultation to Brocklesby who handed this communication to Wilkes. In rather flippant terms Wilkes wrote to both Heberden and Hawkins to the effect that at present he was not able to receive them, but hoped to be able to do so in a few weeks' time. About Christmas he slipped over to Paris and sent a certificate of illness dated January 11, 1764, to Sir John Cust, the Speaker of the House of Commons. On January 19 the House of Commons expelled Wilkes because he had refused to admit Heberden and Hawkins sent by their authority to examine the wound, and pointed out that his retreat to France rather indicated a distrust of his cause than anything amiss with his constitution. The *Annual Register* contains a full account of this incident including the correspondence between Heberden, Brocklesby, Hawkins and Wilkes. Although he had resigned his fellowship at St. John's College, Cambridge, some months before he would have vacated it by marriage, he kept in touch with the College, the records of which show that on December 27, 1764, it was "agreed to send Dr. Heberden a collar of brawn every Christmas."

Heberden and the Royal College of Physicians of London. At the Royal College of Physicians of London Heberden played many parts; besides the posts of Goulstonian (1749) and Croonian lecturer (1760) and Harveian orator (1750) mentioned on page

417, he was councillor in 1762, censor in 1749, 1755 and 1760, and elect from 1762 to 1781. The elects were eight senior fellows of the College who chose the president from among their number; this *imperium in imperio,* which ceased to exist in 1860, may account for some vagaries in the occupancy of the presidential chair; thus John Caius was president in 1555, 1562–3 and 1571, and Henry Atkins in 1606, 1616, and 1624, others having a turn in the intervening years. Between 1785 and 1803 Sir George Baker and Thomas Gisborne changed places on five occasions, no one else having occupied the presidential chair during this period. Since 1860 the election of president has been vested in the whole body of fellows. The number of fellows in 1782 was 43 only as compared with about 490 in June, 1933, so the autocratic power of the elects was then vested in one-fifth of the fellows of the College in 1782; in 1933 it would have been wielded by one-sixtieth of the fellows had the practice of the elects still survived.

In 1767 Heberden, loyally seconded by his former pupil Sir George Baker, was the moving spirit in getting the Royal College of Physicians to hold meetings for the reading and discussion of papers and their publication in the *Medical Transactions, published by the College of Physicians in London.* These Meetings were modelled on those of the Royal Society and of the numerous medical Clubs and Societies which sprang up in the second half of the eighteenth century. In "A Sketch of a Preface designed for the Medical Transactions," 1767, published in the appendix of the "Commentaries," Heberden pleaded for observation as against authority:

> The deference, which is sometimes required in physic to the authority of the ancients, would incline anyone to suspect that the improvements in the art of healing had not kept pace with those that have been made in other branches of natural knowledge. Philosophers have long ago thrown off Aristotle's tyranny; yet some physicians still choose to wrangle about the meaning of the ancients, rather than to consult nature herself. Are they afraid of approaching her immediate presence without making use of the intercession of Hippocrates and Galen? and is that reverence to be still paid to her once famous ministers, which is properly due to nature alone, notwithstanding all that Bacon, and Harvey, and Newton, and our other great reformers have witnessed against this mistaken veneration?

The *Annals* of the College record that the Comitia Majora of August 11, 1767, appointed a committee for the publication of medical papers, consisting of Lawrence, Heberden, Pitcairn, Akenside, G. Baker, Richard Warren, Munckley, and Hinckley. Six volumes of *Medical Transactions published by the College of Physicians in London* appeared, in 1768, 1772, 1785, 1813, 1815 and 1820. But the considerable interval between the appearance of the volumes necessarily delayed the publication of the papers read at the meetings.

To the first three volumes of the *Medical Transactions* Heberden contributed sixteen papers, six in the first, seven in the second, and three in the third volume.

(1) "Remarks on the Pump Water of London, and on the Methods of procuring the purest Water" (1: 1–22, 1768). Read at a meeting of the College on June 22, 1767.

(2) "Observations upon the Ascarides" (1: 45–59, 1768). This includes a section, separately entered on the table of con-

tents of the volume: "Remarkable good effects of large Doses of common Salt, in an extraordinary case of Worms." Read on June 22, 1767. Like most of these papers, its substance reappears in the "Commentaries."

(3) "Of the Nightblindness or Nyctalopia" (1: 60–63, 1768). Read on July 6, 1767. A single case is reported. The word nyctalopia is used in the present-day sense, but this has not always been so. The history of the use and meaning of the words nyctalopia and hemeralopia was considered in scholarly articles by W. A. Greenhill and J. Tweedy in 1882. Though etymologically nyctalopia should imply night-sight rather than night-blindness, nearly all the classical writers and their successors up to the middle of the seventeenth century used it for night-blindness. In the eighteenth century confusion arose; nyctalopia was used for day-blindness and hemeralopia for night-blindness, and in the nineteenth century Sir William Lawrence in 1841, most ophthalmic surgeons, and M. P. E. Littré (1801–1881), the lexicographer, followed suit. In his account of night-blindness and day-blindness W. Mackenzie in 1835 left the use of the synonyms open by appending to each of these sections a footnote: "the nyctalopia of some and the hemeralopia of others." But since the papers of Greenhill and Tweedy there has been a return to the original use of nyctalopia (night-blindness) and hemeralopia (day-blindness or total color-blindness).

(4) "On the Chickenpox" (1: 427–436, 1768). Read on August 4, 1767. In the "Commentaries" the synonym *Variolae pusillae* is given. The first attempt to separate chickenpox from smallpox was made in 1730 by Thomas Fuller (1654–1734) who wrote "the pestilence can never breed the smallpox, nor the smallpox measles, nor they the crystals or chickenpox, any more than an hen can breed a duck, a wolf a sheep, or a thistle figs." Heberden established the differential diagnosis, but it was slow in gaining general acceptance. Nearly a century later, in 1866, Gee wrote "the doctrine of Fuller and Heberden has hardly taken root in any country except their own." Hebra, Kaposi, and Kassowitz of Vienna regarded it as a mild form of smallpox, and in 1860 the first named remarked that an experienced physician would not be likely to regard epidemic smallpox and varicella as different diseases.

(5) "The Epidemical Cold in June and July 1767" (1: 437–444, 1768). Read on August 11, 1767. This, like that in 1775, was a pandemic of influenza.

(6) "Queries" (1: 469–474, 1768). Read on August 11, 1767. The questions raised are on the peruvian bark (cinchona), smallpox, the use of camphor in strangury, on the gout, and palsies.

(7) "Of the hectic Fever (2: 1–17, 1772). Read on July 7, 1768. In describing this "symptomatic, irregular or fever of suppuration" he concludes: "In lingering illnesses, where all other means have proved ineffectual, a journey to Bath is usually proposed by the friends, and wished for by the sick; but besides the fatigue and many inconveniences of a journey to a dying person, the Bath waters are peculiarly hurtful in this fever, which they never fail to increase, and thereby aggravate the sufferings, and hasten the death of, the patient." In the "Commentaries" this warning is repeated in slightly altered terms.

(8) "Remarks on the Pulse" (2: 18–33, 1772). Read on July 7, 1768. In this article reprinted in the appendix to the "Commentaries," a modern note is sounded in his words: "Some books speak of intermittent pulses as dangerous signs, but, I think, without reason, for such trivial causes will occasion them, that they are not worth regarding in any illness unless found with other bad signs of more moment. They are not uncommon in health." An anonymous "Sketch of the Life and Character" of the eccentric Messenger Monsey (1693–1788), physician to the Royal Hospital at Chelsea, mentions that "as the Doctor advanced

in years, an irregular stop in his pulse gave him much alarm," and that for this he consulted Heberden, of whose opinion he spoke in the highest terms. Heberden recorded a few cases of extreme bradycardia, but does not describe the Stokes-Adams syndrome.

(9) "Some Account of a Disorder of the Breast" (2: 59–67, 1772). Read on July 21, 1768.*

(10) "Of the Diseases of the Liver" (2: 123–172, 1772). Read on August 15, 1769. This is the longest of the contributions to the *Medical Transactions*, and is solely an account of his own experience. Under this heading he included diseases of "the gall and gall ducts," and the greater part of the article deals with gall stones and jaundice; gall stone obstruction is said to be the most common and the least dangerous of all liver complaints, in fact usually devoid of all danger; but he is entirely sceptical about any solvents for calculi. Cirrhosis of the liver, described as "scirrhous liver" is said to be mainly due to intemperance; while acknowledging the value of Bath waters in the relief of symptoms due to alcoholism, he qualifies this by following the caution with its quaintly worded ending: "Where the liver has become scirrhous, and a hectic fever shews these scirrhi to be in an inflamed state, there the Bath waters will aggravate the symptoms, and contribute no otherwise to end the disease, than by hastening the patient's death."

(11) "Of the Nettlerash" (2: 173–191, 1772). Read on August 15, 1770. In the text the now forgotten name essera, of Arabian origin, is used. Attention is called to its causation by the hairs on the pods of couhage or cow-itch, a sort of french bean. Appended to the article is a letter from Messenger Monsey describing a case of hypersensitiveness of the skin to the actinic rays of the sun, exposure being followed by intense itching, redness, and thickening of the skin, so that it became like leather, these manifestations disappearing within twenty minutes after the exposure was at an end. Considerable relief followed a course of calomel, as if the sensitization was due to intestinal absorption.

(12) "Queries" (2: 499–532, 1778), raised at meetings on July 21, 1768, August 15, 1770, and December 11, 1771. The subjects included "sizy" or inflammatory blood, hernia, venesection in hemorrhage, and the bad effects of damp houses, beds, and clothes.

(*To Be Concluded*)

**Vide* first paragraph of the following installment.

HENRY INGERSOLL BOWDITCH

By ADOLPH A. WALKLING, M.D.

PHILADELPHIA

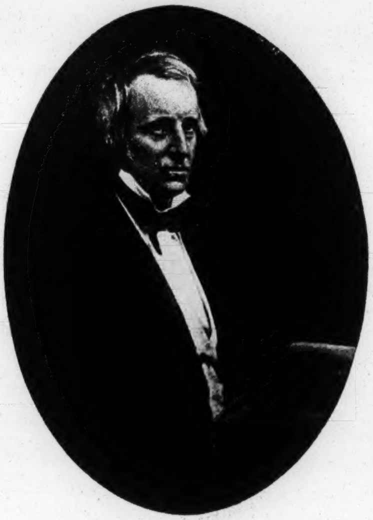
HENRY Ingersoll Bowditch was born in Salem, Massachusetts, August 9, 1808. He was the third son of Nathaniel and Mary Ingersoll Bowditch. His father was the celebrated mathematician.

His boyhood was much the same as any in a small New England town of that period. The puritanical observance of Sunday during his early boyhood and the teachings of both parents left their imprints as a deep sense of religious feeling throughout his life. As a boy, however, there was no lack of love of mischief; but he was always quick and anxious to make reparation if he felt he had hurt or wronged another. He attended a private grammer school while living in Salem. He and his fellow pupils broke into open rebellion when he was fourteen because of the tyranny of one Abiel Chandler, the teacher. They appeared before the committee with a banner on which was inscribed "Up Liberty, Down Oppression." The committee rebuked them but their march apparently bore fruit because a short time later Abiel had a call to enter business in Boston.

His parents moved to Boston in 1823, when he was fifteen years of age. He entered the Public Latin School in Boston, where he stayed two years, then at the age of seventeen (1825) he entered Harvard College as a sophomore. He graduated from college in 1828 and entered the Medical School. He entered medical school with a feeling of doubt and repugnance towards the elementary work necessary to all who study medicine. He had at first a sense of loathing at "cutting up a dead body" but after he studied the wonderful arrangement of the muscles of the forearm he had a sudden change of feeling. This was in part due to the fact that Dr. James Jackson, a noble man, a wise and conscientious physician and an excellent teacher, was his chief instructor. Dr. Jackson in those days was probably the most eminent practitioner in Boston. Bowditch was under Dr. Jackson's guidance later as an interne in Massachusetts General Hospital.

In the spring of 1832 he went abroad to continue his medical studies. He went immediately to Paris where he entered the School of Medicine and came under the influence of the great medical teachers of the day, Chomel, Andral and Louis. For nearly two years he walked the wards with Louis for whom, both as teacher and friend, he felt the highest admiration and esteem. James Jackson, Jr. and Oliver Wendell Holmes were his associates at that time in Paris. Bowditch in May, 1833, had a lengthy discussion with Holmes over the advantages held out to a medical student in Paris when acquainted with Louis. The next day Holmes said that either Louis was the greatest man that ever lived or that he (Holmes) was crazy. In 1892, after Bowditch died, Dr. Holmes sent a letter to a medical meeting and referred to this discussion and generously added, "Bowditch was right and I was wrong."

Bowditch originally intended spending a year in Paris and a second year in England. He stayed in England about four months. He was very much disappointed in the character of the teachers so returned to Paris to his beloved Louis. Sir Astley Cooper seems to be the only notable physician in England to whom he gives praise. His comment of having breakfasted with Sir Astley was, "Sir Astley has all the manners of a gentleman with a great deal of kindness in showing every one of his preparations to those who take an interest in medicine. I have never seen anything like them before and was highly gratified with my visit."



H. I. Bowditch

FIG. 1. HENRY INGERSOLL BOWDITCH AT THIRTY-FIVE.

In August, 1833, he journeyed to Scotland. Having always been a great admirer of Burns, he journeyed afoot among the scenes of Burns' life and poems. He visited the grave of Burns at Ayr and of "sweet Highland Mary" at Greenock. On September 14, he found a nephew of "Highland Mary" living at Pemberton, who had a Bible given by Mary to Burns. The Bible was in two small volumes, the Old and the New Testaments. For a time Mary had one and Burns had the other. The former was the more worn and evidently Mary had used hers more freely. In one volume was a lock of brown hair, said to have been cut from Mary's hair after her death. Bowditch wanted to buy the two volumes but the price was too high. Finally Mary's nephew, William Anderson, gave Bowditch a lock of Mary's hair which he carried carefully preserved in his waistcoat pocket for twenty-five years. Then, on January 25, 1859, he had a locket made for it in which the lock of hair is still preserved.

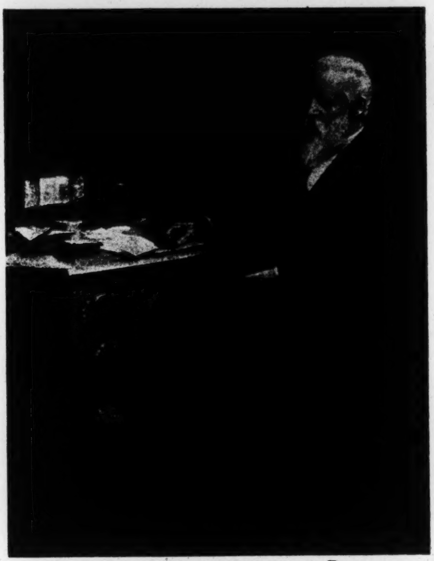


FIG. 2. PORTRAIT OF HENRY INGERSOLL BOWDITCH AT SIXTY-FIVE.

In the autumn of 1833, after his return to Paris, he met Olivia Yardley, who was completing her education in music and who afterwards was to become Mrs. Henry Ingersoll Bowditch. She was the daughter of John Yardley of England.

There was parental objection to the engagement of these two young people. Bowditch's mother had died and his father thought he owed the family something and wished him to begin the practice of medicine. As soon as his father heard of his engagement, Bowditch was asked to return to America immediately. The engagement was broken for a year with the understanding that, if at that time they both felt the same way, parental objection might be overcome. A letter written during that year to Bowditch's father by a friend of the family undoubtedly helped overcome his objections.

> In the hotel where I live, the only persons who speak English are H. Bowditch and two English ladies, aunt and niece, the latter finishing her education. She speaks French, is learning Italian, draws beautifully, plays on the pianoforte and harp delightfully, and sings divinely. She is altogether one of the most talented, accomplished and amiable girls I ever met. Her face reminds me of C. White's, only the expression is better. She is lively without being rude or impudent, modest without being bashful, has great sense and feeling without making a parade of it, acute sensibility without nervous agitation, deep moral and religious feelings without cant or prudery, has a soul for love and sentiment without talking nonsense, and a heart to compassionate and relieve the afflictions of others, and accomplishes a deal without ever seeming in haste or out of humor.

After reading that it is no wonder that the old gentleman agreed to allow the engagement to go on again, which finally ended in the marriage July 17, 1838 in St. John's Church, New York.

In 1834 Bowditch made a short trip to Italy where he made the observation that he was glad that he studied in Paris. On April 16 of the same year, when his mother died of pulmonary tuberculosis, he said he was more confirmed than ever to make the study of this disease his desire in life.

At the end of his first year's practice (1835) in Boston, Bowditch was quite elated over the accumulation of $75.00 and laughingly said that it was equal to that of one of Boston's best known physicians, Dr. John Ware, during his first year of practice.

Bowditch was an ardent abolitionist and was in difficulties often because of his speeches on this subject. He began his activities against slavery late in 1835 in the second year of his practice. He lost many of his and his family's dear friends by openly expressing his views against slavery. His hatred was first aroused when a mob tried to force the north door of the state house in Boston on October 21, 1835 to "snake out" Garrison who was the editor of the antislavery pamphlet "Liberator." He became very active in all antislave activities. A brother doctor stopped him on the street and told him he would not be successful if he continued as he had done the past few weeks. His comment was as follows:

> It is very kind of you to give me counsel, although I cannot follow it. You will bear me witness that I have never thrust my opinion upon you or any one. I have acted as I have thought rightly for the slave. Now let me tell you that I deem you and others like you, who would

repress free speech upon slavery, as men wholly recreant to the principles for which our fathers fought and died at Bunker Hill. Good morning, my dear doctor.

He was deeply religious and in 1835 also became an earnest worker in the Warren Street Chapel, an institution which still exists but is called the Barnard Memorial. In 1842 he asked permission in a letter to the managers of the chapel to use the building for antislavery meetings. He fully expected the answer to be "no." His determination to do what he thought was right in spite of the consequences is aptly brought out in the last sentence:—"I am well aware that expediency will say 'Nay,' but you must know me well enough to be assured that I care not one iota for expediency when it stands in the way of duty, as I believe it does now." He resigned from the chapel finally because of objections to his addresses to the children at the meetings and because there was objection to allowing colored children to sit in the pews with the whites.

During all these activities he translated several of the works of his beloved Louis, especially those on typhoid fever and phthisis. He was appointed admitting physician to the Massachusetts General Hospital in 1840. In 1841 he tendered his resignation because the board passed a law excluding negroes from treatment. This law was rescinded and Bowditch continued as admitting physician until 1846 when he was appointed physician to the hospital. The latter position he held until 1863 when he resigned. He was made consulting physician and remained on the board until his death.

Bowditch was a member of the famed Latimer Committee in 1842. George Latimer was a runaway slave from Virginia who was captured in Boston. This committee was formed to help Latimer retain his freedom. A petition containing 51,862 names from Massachusetts was presented on the table of John Quincy Adams in the Capitol in Washington. This immense roll of paper was about the size of an ordinary barrel. Little was done at this time, however, except to let the country know how Massachusetts felt about slavery. Latimer was finally bought by a cleric in Boston to settle the controversy. John Greenleaf Whittier wrote his "Massachusetts to Virginia" especially at the request of Bowditch to be read at the meeting at which the petition was pasted together.

In 1850, after the fugitive slave law was enacted, Bowditch tells of an amusing incident when he helped a runaway slave to England. They drove out of Boston early on a Sunday morning, the slave with a "blunderbus" in one hand and a revolver in the other. Bowditch had a small pistol in one hand and drove the horse with the other. Bowditch gave an instance of his pluck and his determination to espouse the cause of antislavery by walking down a Boston street arm in arm with a runaway slave.

In 1844 he commented on the fact that he was the only member of the Board of Managers of the Antislavery Society that did not go in for disunion (about 36).

In 1846 he founded the Co-operative Building Society to better the condition of the tenements of the poor. In the same year he formed the Society for Medical Observation, limited to twelve members, meeting twice a month. The members included the instructors at the Boylston Medical School. Bowditch modeled this Society after one to which he had belonged in Paris under the leadership of Louis. The criticism of the papers was so keen, although always courteous, that some of the members resigned from time to time. It was before this Society on October 20, 1851 that Bowditch read a voluminous paper "On Pleuritic Effusions and the Necessity of Paracentesis for their Removal." In this he described and pictured Morril Wyman's syringes and trocars.

During this period he had time to watch under the microscope the egg of the snail. Mrs. Bowditch made the drawings for him. He seemed to rest by a change of work and apparently was "resting" while not engaged in the practice of medicine. He must have had remarkable powers of concentration. It was a common occurrence for him to take up the morning paper at the breakfast table and become so absorbed in something that ordinary attempts to attract his attention were useless. He often worked at the library table while members of the family were laughing, talking or singing about him. Even children playing about did not disturb him; but at the least sign of discord, work would end and all were given to understand that permission to remain near him depended upon their good behavior.

His most notable work in medicine was done during those hectic days of slave saving. It was during the year of 1850 that Bowditch began his work and writing on paracentesis thoracis. Paracentesis had previously been performed by inserting a trocar through a surgical incision. He endeavored to convince the profession that paracentesis thoracis properly done was not only necessary to save life but attended with little or no danger. The almost universal use and success of the operation is due to the work of Bowditch using and advising the instrument that Morril Wyman perfected. He forced his opinion on the medical profession for years until he was satisfied his views were accepted. Most eminent practitioners in Boston were openly antagonistic. Dr. John C. Warren was one who favored his views. Through the efforts of Bowditch the treatment of pleural effusion, heretofore performed by surgeons alone, was changed from a hazardous, painful procedure to a simple operation that could be handled by any medical man with the aid only of an aspirating needle and a suction pump or syringe. He claimed no priority in the invention of the instrument or character of treatment but he certainly brought the profession to realize that the treatment should be instituted more often and could be performed much more simply. He always insisted that Morril Wyman receive credit for the invention of the small trocar and cannula. His sole desire in this matter, as in others, was that truth as he believed it should be given to the world. He never contested the claim of Dieulafoy of France as to the invention of aspiration. Dieulafoy published his work in 1870, twenty years after Bowditch's first case. Bowditch's first article on aspiration was published in *The American Journal of the Medical Sciences* in 1852.

About 1852 he received a wound on the middle finger of his left hand while attending an obstetrical case which resulted in septicemia. The finger was afterwards stiff and was the cause of his confining his practice thereafter to diseases of the lungs and heart.

It was just about this time that Whittier again came to the aid of his friend with a quatrain that was composed especially to be engraved on a sun dial that stood in the front of Bowditch's house at the farm in Weston, Massachusetts. These four lines are well known to students of Whittier.

With warning hand I mark Time's rapid flight
From life's glad morning to its solemn night;
Yet, through the dear God's love I also show
There is light above me by the shade below.

The sun dial is still in his children's home in Boston.

In 1854 the Massachusetts Medical Society requested him to report at a subsequent meeting upon the question of the distribution of tuberculosis in Massachusetts. He was at this time a consultant in diseases of the chest. He sent a circular to some one physician in every town in the State. Those who did not reply received a second circular, a third, a fourth. He wrote again and again until replies were received from everyone. His report was not completed until 1862, eight years later, when he presented his report entitled "Soil Moisture" to the State Medical Society. As a result of this investigation he firmly believed that excessive moisture and lack of sunlight in the houses predisposed to tuberculosis. He proved to his own satisfaction that many patients improved or got well if they moved to a dry area with sunlight. He published a pamphlet entitled, "Consumption in New England," which contained the facts of his investigation and report. This investigation also led him to think that tuberculosis was contagious. A paper entitled "Is Consumption Ever Contagious" was read before the Boston Society for Medical Observation and published in 1864.

He was appointed Jackson Professor of Clinical Medicine at Harvard in 1859 at the age of fifty-one. He resigned the Professorship of Medicine at Harvard in 1867 when fifty-nine years old, due to the pressure of other duties. As a teacher he had little capability of oratorical display but his careful examination of patients and analysis of symptoms rendered his exercises very attractive and highly valued by students. Bowditch influenced those who came near him more by his unselfish zeal in his search after truth and the welfare of his patients. The clinical conference was his most valuable method of teaching students. In this he followed the method of Dr. George C. Shattuck whom Bowditch succeeded as professor.

In the same year he went to Europe to show the instrument which Dr. Wyman devised for tapping the chest. He alludes to Dr. Wm. T. Gairdner of Glasgow and Dr. Budd of King's College, London as the two who received his views on paracentesis with courtesy and interest. His treatment in Vienna was different. The famous Skoda scornfully turned on his heel and walked away as Bowditch began showing the instruments. He also speaks of Drasche and Rokitansky but not as disparagingly. The French accepted his theories and apparatus with more graciousness and he was quite pleased with his visit there.

At the very outset of the Civil War, Bowditch volunteered at the request of Governor Andrews to go to the war zone to care for the wounded. He had a very amusing and sad experience with some of the so-called ambulance drivers. This led him to urge upon Congress the formation of an ambulance and hospital corps with trained personnel. This bill passed the House but was killed in the Senate by Senator Wilson of Massachusetts as being impractical (February 24, 1863). Shortly after this happened, on March 11, he was called to deliver the valedictory address to the graduating class of the Harvard Medical School. He spoke mainly of the work that most of the graduates would be doing at the front.

On March 18, 1863 his oldest son, Nathaniel, who had been a premedical student and had been commissioned a second lieutenant in the Massachusetts Cavalry, was wounded and died shortly after. After investigating the circumstances of his son's death, he had prepared a "Brief plea for an ambulance system as drawn from the extra sufferings of the late Nathaniel Bowditch and a wounded comrade," which was circulated as an appendix to the address he gave to the graduating class. A short time after this publication, Senator Wilson wrote to Bowditch that he would introduce a bill into the Senate for the establishment of an ambulance corps.

In 1863 he was appointed Surgeon of the Board of Enrollment of the Fourth Congressional District of Massachusetts. The Board's duty was to examine all recruits. On January 21, 1865, he examined a man who afterwards sued him for $10,000 and collected $1,000 for assault and battery. This man was an English army deserter from Canada. Bowditch, with the acquiescence of a lawyer, branded him with silver nitrate. The suit resulted.

The year Bowditch presented to the State Society his observations on "Soil Moisture" (1862) he brought before the Society a plan to have the Governor organize a State Board of Health. He had made topographical maps on the distribution of tuberculosis and felt that similar maps should be made for all diseases.

In July, 1867, after resigning from Harvard, he went abroad again for a rest. He visited England, France, Italy and Switzerland. He, as one would suspect, was a great admirer of Garibaldi. It so happened that in September, 1867, the International Peace Congress was in session in Geneva. He gives a very interesting account of a parade in Garibaldi's honor that he witnessed. He was quite thrilled to have so great a man smile upon him. He visited the scenes of his student days while in Paris and spent considerable time with his old teacher Louis, who did not yet quite agree with him on paracentesis. October, 1867 found him in London where he met and heard Sir James Paget. Bowditch remarked, "He is the most eloquent man I ever heard on matters of science. He speaks without notes, chooses the best and choicest language, carries all with him and keeps them always entertained and interested for he always teaches something new." He returned to Europe for the last time in 1870. He particularly mentions at this time his visit to Strassburg just after the bombardment.

It was not until September 15, 1869 that the first State Board of Health in the United States was organized in Massachusetts mainly because of Bowditch. He was elected Chairman at the next meeting on September 22, 1869. The Board was very active in controlling disease and in improving sanitation. Bowditch felt that one of the greatest achievements of the Board was the abolition of private slaughter houses, and the establishment of an abattoir at Brighton. The Board functioned not without some slight discord but always gave an unanimous report to the legislature. The first report of the Board received very favorable comment in this country, England and France.

One of the most important contributions to the reports of the State Board of Health was his article entitled "Intemperance in New England and How Shall We Prevent It." This was published in 1871. He followed the plan as on "Soil Moisture." Questions were sent to many physicians and laymen in various parts of the civilized world. The results justified his belief in light wines and beer, and he advised their substitution for stronger liquors. He was the target of a storm of abuse from the Prohibitionists because of this report.

In 1874, in the fifth annual report of the Board, he published an article entitled, "Preventive Medicine and the Physician of the Future." He felt that as preventive medicine advanced the physician would stand higher than before.

As a result of his activities in the State Board of Health, he was invited by Dr. Samuel D. Gross, Chairman of the Centennial Committee, to deliver the centennial address on "Public Hygiene" before the International Medical Congress held in Philadelphia in 1876. The address, entitled "Public Hygiene in America," was received with such favor that a motion was passed to send copies to each Governor, the President of each State Society and Sanitary Boards of this country and Canada. While in Philadelphia, he was the guest of Dr. Alfred Stillé. In 1877 he was elected President of the American Medical Association, largely as a result of this address.

He became active in the Association at its inception. He early advocated the education of women as physicians and was one of the first to champion the cause. In 1867 at the meeting of the American Medical Association in Cincinnati he, as vice-president, argued in its favor. Nothing was done about it at this time. In 1881 he wrote a paper entitled "Medical Education of Women," etc. He even stated at one time that he referred several cases to women practitioners, when he thought the patient needed womanly insight. It was not until 1884 that women physicians were admitted as members of the Massachusetts Medical Society. He pleaded for the establishment of a medical school for women at Harvard.

On March 3, 1879 a National Board of Health was established by an Act of Congress. Dr. Bowditch was appointed on the Board by President Hayes. The first work of this board was the control and eradication of yellow fever in Memphis in that year. He resigned from the National Board of Health in 1882 and later wrote a letter which appeared in the *Sanitarian* outlining practically what is now the present health organization of this country. He severely criticized President Arthur, who prevented the use of $100,000 Congress had voted the Board.

Bowditch began having trouble with his hearing after 1880 and became irregular in his attendance at meetings. This, of course, did not prevent him from writing and reading many papers.

The American Academy of Medicine in 1888 requested him to prepare an address on "Tolerance and Intolerance in Medical Societies." This was the result of the distress felt while at a meeting of the American Medical Association where the "Code of Medical Ethics" was discussed. He stated then that he thought the only code necessary was the simple yet forceful statement of Christ when he said, "Whatsoever ye would that men should do unto you, do ye even so unto them."

Strangely enough the last paper he ever read in public was entitled "Open Air Travel as a Means of Cure for Consumption." This was the practical experience of his father who, when about thirty-five years of age, having had hemoptysis and other signs of tuberculosis, adopted this method of regaining his health. His father succeeded in arresting the disease by a long journey of several weeks through the eastern states with a horse and buggy. This paper was read in 1889 before the American Climatological Association meeting in Boston.

In 1890 Bowditch began to show the effects of the malady which was to cause his death. It was in 1880 that he found out that he was suffering from the same condition his father had. The knowledge affected him but slightly as far as work was concerned. His mode of living was changed in that he took prolonged vacations in the summer, living in the country for months at a time. Mrs. Bowditch died of pneumonia in December, 1890, and from that time Bowditch grew visibly weaker. He returned to Boston during the winter but failed rapidly both physically and mentally. The following summer he was taken to the country at his own request to revisit the spot that had been hallowed by the memories of the previous year. Although almost incapacitated for work, either mental or physical, for the greater part of the time, he wrote an occasional letter to an old friend. In September, 1891, he became rapidly worse and was taken back to Boston. He rallied somewhat after returning to his home in Boylston Street, but on January 14, 1892, he died.

Dr. Bowditch's life was a very full one, distinguished, whether we consider him as a physician, teacher, citizen, or simply as a man, by courage, simplicity, zeal, industry, and an intense interest in progress. There never was a man who more completely disregarded consequences when he felt that duty dictated action; whether this was a criticism of current medical practice, or of the selfish motives of obstructors of sanitary legislation, the defense of a runaway slave, or the branding of a deserter from the army.

That his industry was remarkable is testified by the large number of pamphlets and almost innumerable scrap-books and manuscript notes upon all subjects left by him. This trait may have been inherited, and certainly was taught by his father, who once seeing some idlers lounging about in Salem said, "I wish I could have the time of those men."

Up to his very last years Dr. Bowditch's interest in progress of every kind was most enthusiastic. Nothing could dampen his zeal in the search of new truths. This led him to sympathy and association with the youngest of our profession. He would welcome promises of good to come from this and that new method of practice, as if he had not been already disappointed a thousand times. When they were a little past sixty years of age a classmate came in one morning and said mournfully, "We are all dying." "Hang it," retorted Bowditch, "We are still alive: go to work"; and he himself continued always to act up to the well-known proverb, "Work as if you were going to live forever, live as if you were going to die tomorrow."

Henry Ingersoll Bowditch surely paid the debt which Lord Bacon said every man owes to his profession, "by leaving it better than he found it."

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AN ACCOUNT OF

DR. THEODORE TURQUET DE MAYERNE'S "PRAXIS MEDICA"

AUGSBURG, 1691

By THOMAS GIBSON, M.D.

KINGSTON, ONT.

THE title-page of this edition may be translated as follows:

> The Medical Practice of Theodore de Mayerne, Counsellor and Chief Physician to the King and Queen of Great Britain, a reprint of the London copy printed in 1690; to which has been added the same author's quite remarkable tract "Concerning the care of Pregnant Women," from a manuscript found in the library of George Jerome Velschius, of happy memory, never before printed. Augsburg, published by Laurence Kroniger and the heirs of Theophilus Göbelius, 1691.

The original Latin edition, printed in London in 1690, was entitled "Mayerne's Practice in Internal Diseases, especially those which are More Dangerous, and in Chronic Affections." The editor was Sir Theodore des Vaux, Mayerne's godson. The publisher was S. Smith.

The writer of the foreword was Walter Charlton, M.D., born in a Somersetshire rectory in 1619, later of Magdalen College, Oxford, and in his early twenties one of Charles I's physicians during the civil war. He did similar service for Charles II during his exile, and after the Restoration held important offices in the College of Physicians. A contemporary speaks of him as a "learned and unhappy man, aged and grave, yet too much given to romances." This tendency is suggested by the fanciful titles of some of his numerous treatises on all kinds of themes.

With the fondness of his time for similitudes taken from the classics, Charlton likens the attempt to build a complete system of practice out of the fragmentary case-records of Mayerne to the failure of the servants of Hippolytus to recover all the parts of his fair body, torn asunder by being dragged along the rough Aegean shore, when his chariot steeds took flight, maddened by the sea-monster sent forth by Neptune in response to the curse pronounced by Theseus upon his son.

Necdum dolentum sedulus potuit labor
Explere corpus: hoccine formae decus?[1]

The book, Charlton tells us, is the result of the labors of a group of men learned in the mysteries of Hygeia. Relying upon the authority of Mayerne, and desiring to broadcast his opinions over a wide field, they endeavored to bring into order and logical connection the principles of treatment scattered among notes, hastily put down upon all sorts of occasions, by their great contemporary. After all their toil, they are aware that there remain "lacunae," even "chasmata," which the labors of a Hercules would not suffice to fill full.

Hence it comes about that this adoptive child, born so long after the true author of its being had departed to the heavenly realms of light, may seem to lack that beauty of form, that majestic manly countenance, that nervous well-knit frame which would bear witness to the nobility of its parentage—lineaments which in other presentments of our hero's personality might be admired, while he yet lived, plainly set forth to be gazed upon.

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[1] Seneca. Thyestes.

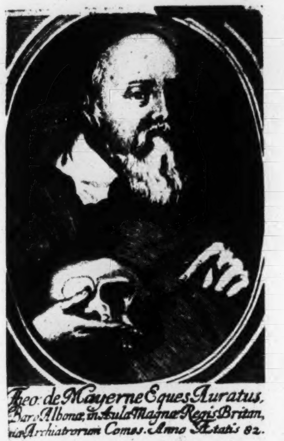
Theo: de Mayerne Eques Auratus,
Baro Albonæ, in Aula Magnæ Regis Britan,
niæ Archiatrorum Comes. Anno Ætatis 82.

FIG. 1. FRONTISPIECE IN THE AUGSBURG EDITION OF THE "PRAXIS MEDICA," THE SAME, ONLY REVERSED, AS IN BROWNE'S "OPERA MEDICA." FROM A PORTRAIT IN THE HALLWAY OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON; PAINTER UNKNOWN.

Theodore Turquet de Mayerne was born near Geneva in 1575, the son of a Protestant Swiss historian, Louis Turquet de Mayerne, and Louise le Macon, his wife. He was named after Theodore Beza, his godfather. After four years at Heidelberg he studied medicine at Montpellier, receiving his M.B. in 1596, his M.D. in 1597. Chemistry was his hobby and the leisure pursuit of his life. He was the physician to Henri IV until the assassination of that monarch. James I called him to London where he was royal physician to James and his two successors and to Prince Henry Frederick during the latter's fatal illness, so fully described in Mayerne's case book. The late Dr. Norman Moore was the first to point out that the "new disease" of that period in England was typhoid fever, and that Mayerne had provided the first detailed report of a clinical instance of this disease.* Mayerne died at Chelsea in 1655. Dr. Moore quotes Astruc's "Memoirs of the Medical Faculty of Montpellier"† as chief authority for the life of Mayerne.

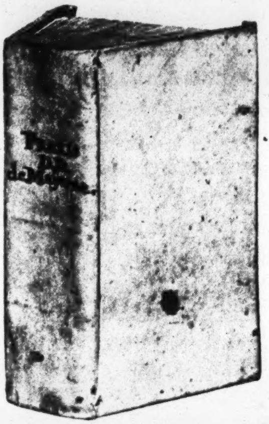

FIG. 2. VELLUM-COVERED AUGSBURG EDITION OF MAYERNE'S "PRAXIS." DR. FRANCIS SAYS IT IS UNUSUAL TO HAVE THE DOMINI DOMINI SO INDICATED ON THE BACK, APPARENTLY IN PEN AND INK.

It may be noted in passing that Mayerne sat to several distinguished artists. Peter Paul Rubens represented Philip IV's Privy Council of the Netherlands in London for about nine months, ending early in March, 1630. He painted Mayerne twice at the age of sixty-six. One of these works is in the National Portrait Gallery, and the other, only completed as to the head and shoulders, is in the British Museum. A portrait painted when he was eighty-two, by a painter unknown, hangs in the hall of the Royal College of Physicians. Another portrait, by Wollaston, is in the Bodleian Library, and still another, by Dobson, the English Tintoret, is at Knowle, Seven Oaks, Kent. In the words quoted above there is, without doubt, an admiring reference to Mayerne's look and bearing as he moved among the men of his time.

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* *St. Bartholomew's Hosp. Rep.*, vol. 17, 1881.

† Paris, 1767. See also Dict. Nat. Biog.

An approbation and permission to publish, copied from the London edition, follows the foreword of the "Praxis." It is signed by the president and censors, and is dated June 11, 1691, instead of 1690. The object was to suggest that the London group had placed their imprimatur upon the Augsburg edition as well as upon their own.

The body of the work consists of 606 pages of therapeutics arranged in three books entitled "Affections of the Head"; "Affections of the Thorax," and "Affections of the Abdomen." Each chapter of each book treats of one disease or salient symptom, and most elaborate pharmaceutical formulae stun one's clinical imagination on every page. It is no wonder that the apothecaries loved to ply their mystery for men who made their art so luscious and so lucrative.

Pages 595 to 606 contain a short addendum upon the treatment of variola, the cause of which is said to be a boiling up of the blood, as Rhazes held so many centuries earlier. Then follow twenty-two pages of special Mayernian formulae, with the numbers of the pages in the foregoing text upon which their use is referred to. An index of the books, with the subjects treated of in each chapter, completes the undertaking. There is an advertisement to the effect that if this book should be favorably received by the profession, another dealing with fevers, skin diseases and venereal diseases would be prepared.

A good notion of how serious a thing it was to embark upon a course of physic under the care of one of these heavy-handed physicians, may be obtained by a recital of Mayerne's "methodus medendi" in a case of ozaena. This we find in Book 1, chapter xvi.

He begins by warning the practitioner that this condition is often one of the symptoms of syphilis, in which case cure can only follow a proper course of treatment for the main disease. Sometimes it is due to acrid, salt humors descending upon the nares. Whencesoever the disease may arise, after a phlebotomy (if that be required), a purgation by emetics and purgatives and a derivation by blisters, the following plan of treatment may be tried. During the whole course of two or three weeks of treatment, the patient must take the "Decoctum traumaticum et sudorificum." This preparation takes twenty lines of print to describe fully. It contained sarsaparilla, burdock, peony, scrapings of rose and of box wood, scraped ox bones, leaves of betony, ground-pine, sanicle, cowslip, St. John's wort and elder. These are to be pounded and steeped for twelve hours in water in a suitable vase well covered, then they are to be slowly brought to boil and strained off from the fluid decoction. Eight doses of this must be taken morning and evening. To provoke sweating after the morning doses, let the patient rest in bed, or in a sweating tub, with external heat about him, for an hour, and a second hour, if his strength permits. One must be sure that the head sweats well.

If the bowels do not move well, let some cathartic solution be added to the evening doses of the decoction. Each morning after the body is cool and dried after the sweating, let the following gargle be used. This contains several of the same herbs as the decoction, with guaiacum wood scraped, all mixed in oxycrate (vinegar and honey in water), to which are added honey, alum and a quart of the best claret.

The throat is to be thoroughly gargled with this preparation, and then the nares irrigated with the following solution, warmed. If desired, however, instead of the irrigation, linen thread tampons soaked in the solution may be inserted in each nostril.

"Mistura naribus indenda": this contained guaiacum, rose, fennel, birthwort, sassafras, garlic, iris, holy thistle, betony, speedwell, ground-pine and honeysuckle. They are to be made into a decoction in the usual way. Eight ounces of the clear fluid are to be added to 4 ounces of Malaga wine, with Aegyptiacum, honey, aloes and myrrh, of each one scruple and 18 grains. Half an ounce of the strained result is to be injected into each nostril twice daily by means of a syphon, or else drawn up through the nose.

Half an hour after this nose-washing, a fumigation must be taken. The ingredients of this were: Gum of guaiacum, amber, benzoin, nutmeg, cloves, sage, marjoram, rosemary, tobacco, vermilion (HgS) and willow charcoal, all ground to finest powder, and mixed with a little mucilage. Then one must dry the whole before a fire slowly and rub down roughly. Of this let 5 scruples be burnt at each treatment, and the ascending smoke inhaled through clay pipes into the mouth and exhaled through the nostrils, as is done with tobacco.

Or, after the irrigation has been completed, and the nares thoroughly cleared, any ulcer may be painted with a brush or soft sponge dipped in the alum-water of Fallopius. (There was an alum-water of Bates in the eighteenth century which contained alum and zinc sulphates, and was used as an astringent wash for indolent ulcers. Pereira.)

He must take also an electuary. This contained sarsaparilla, chicory, peony, cloves, tormentilla, betony, sea-speedwell, ground-oak, ground-pine, scrapings of human skull, both burnt and unburnt, flesh of vipers, antimonial diaphoretic, all mixed and digested in alcohol, and finally let the excipient be a Canary-wine infusion of speedwell and betony very thoroughly strained, and prepared without boiling. The dose of the electuary is one ounce each morning.

The appended tract, dealing with the care of pregnant women, takes up the last fifty-six pages of our volume. The matter is arranged in eleven short sections, and in no very logical order.

In threatened abortion the mother must rest in bed and take digestible upbuilding food. The fetus is to be encouraged to stay where it is by a powder containing many Kermes grains, which grew on the bark of the red oak and were believed to have styptic virtue, mastiche tears, a resinous exudation with similar properties, and green vitriol ($FeSO_4$). This powder the mother must take hourly through the morning, washed down with red or chalybeated wine. The pelvic regions must be covered with a plaster of a variety of resinous drugs and certain astringents, including green vitriol, mixed with Venice turpentine and white wax.

There are three mentions of Peter Chamberlen, senior, the reputed inventor of the obstetric forceps. William, his father, landed at Southampton as a Huguenot refugee in 1569. Both his sons were named Peter, and were barber-surgeon-obstetricians. Peter, senior, lived till 1631 and was one of the physicians to James I and Anne of Denmark. Early in Mayerne's tract, he is quoted as recommending beaten-up egg as a lubricant for the mother's passages in cases where premature rupture of the membranes caused delay during the first stage of labor. The most interesting reference may be translated as follows:

> When the patient's strength is almost exhausted and nature is on the point of succumbing, the uterus gapes widely, for the os interior, yea the whole body of the organ becomes quite flaccid, on which account it yields very easily to the hand of the surgeon, and admits it without the use of any force. Thus did Chamberlen, senior, in my presence, deliver the wife of Sir William Alexander, in the briefest possible time, when she was at the point of death owing to extreme loss of blood. The same Chamberlen asserts that a fetal arm presenting should be slowly and gently replaced in the uterus, and the feet sought for.

There is, naturally, no mention of the forceps, for the Chamberlen family kept the secret for a hundred years. The instruments spoken of are the short perforating hook, the longer hook for extracting the head left in the womb cavity after violent traction in a breech delivery has torn the neck across, and the noose made of such material as women use to bind about their hair. This last was used to throw around various accessible parts of the fetus, as a means of traction-extraction. No mention is made of whalebone in connection with the fillet.

Placenta previa is not so named, but the condition is described as one in which the placenta slips down from its proper attachment upon the side of the womb. Mayerne advises separating the placenta before extracting the child, although he evidently is aware that the patient is in danger from the hemorrhage. He wants early delivery, but thinks that he must first clear the bulky soft mass out of the way. Thereafter the mother is to be restored with wine and cardiacs.

For an occipito-posterior case he recommends podalic version. Care is to be taken that the after-coming head is brought down "prone," that is, face to mother's back. This is to avoid the chin catching upon the symphysis. The finger may be put into the child's mouth so as to guide the face toward the chest, or, as we should say, to avoid extension of the head before its delivery.

Convulsions, before or during labor, are thought to be due to nervous disturbance depending somehow upon impressions passing upwards from the stretched uterus, or to psychological causes, such as fear or rage. They call for early delivery. The cervix is to be opened by the fingers or by a dilator. The latter he does not describe. Strong pains are to be excited by frictions over the abdomen.

A crude form of episiotomy is suggested when the vulva is excessively stretched in a primiparous case. With the finger nail, or with two fingers inserted on one side between the head and the soft parts, one may tear the tight edge, so as to allow the head to come more easily.

Velschius, in whose library the tract, "The Care of Pregnant Women," was found, was one Georgius Hieronymus Velschius or Welsch (1624–77), born at Augsburg in the year 1624. He had a varied experience as student at Tübingen, Strasburg and Padua. Besides his later medical studies, he devoted much time to languages, and was, to some degree at least, versed in those of the Orient, probably Arabic in particular, judging from the title of one of his discourses. He sowed beside many waters, but did not plant deeply enough to reap anything but scanty and unappetising mind-food.

Larousse tells us that by far the greatest number of his writings, "actual or only imagined," never saw the light in print. There was published in Vienna in 1660 a quarto volume concerned with the calculi found in the alimentary tract of mountain goats (bezoar stones?); an octavo at Ulm in 1668 containing a review of medical reasonings and observations of the fourth century; in 1674 an essay was published at Augsburg, on the guinea worm according to the opinion of Avicenna, exhibiting a specimen of a new version from the Arabic, with a more copious commentary, to which is appended another essay upon the hair-like worms found in infants. At Vienna there was published in 1698 a posthumous octavo entitled "Two Thousand Cases of Outlandish Cures" (*exoticarum curationum*).

Velschius, then, was rather a linguist antiquarian than a productive systematic student of medicine. But his library would hold many curious and interesting books and manuscripts. Among the latter was found a manuscript of Mayerne's tract upon the care of pregnant women, which the Augsburg publisher of his "Praxis Medica" appended thereto in the 1691 reprint from the first English edition.

The writer gratefully acknowledges the assistance, in regard to many details, of Dr. W. W. Francis, Curator of the Osler Library, McGill University, Montreal.

THE "DE OVORUM GALLINACEORUM GENERATIONIS PRIMO EXORDIO PROGRESSUQUE, ET PULLI GALLINACEI CREATIONIS ORDINE" OF VOLCHER COITER

TRANSLATED AND EDITED WITH NOTES AND INTRODUCTION BY

HOWARD B. ADELMANN, PH.D.

ITHACA, N. Y.

PART II. CONCLUSION*

As for myself, in May 1564 at Bologna, stimulated by Doctor Ulysses Aldrovandus (that most distinguished professor of ordinary philosophy, a man expert in the knowledge of the various sciences and arts as well as of philosophy and especially natural philosophy, my encourager and teacher to be cherished with perpetual regard), and encouraged by other teachers and students, I had selected two clucking hens ready for incubation. Under each of them I had placed twenty-three eggs[17] and in the presence of those men, I opened one on each day, in order that we might determine these two things especially, to wit—the origin of the veins and what is first formed in the animal.[18]

In an egg of the first day[19] I saw that the yolk had acquired a white circle which was not very large. In its middle there was a point or disc of the same color. From the circle two similar circles[20] flowed away. One of them was thicker and longer than the other. The yolk was more fluid than the yolk of a fresh egg.

On the second day[21] I saw two very thin pellicles or membranes, one of which adhered immediately to the shell;[22] the other, which surrounded the substance of the egg, was separated a little from the shell,[23] for a small space at the end of the egg was empty. The yolk had risen toward the pointed end of the egg as Aristotle[24] says happens on the third day. The middle part of the yolk was seen to be clearer than the remaining portion.

In the middle I saw something resembling semen.[25] The point and the circle were found under the membrane surrounding the substance of the egg. They were bestrewn with certain sanguineous filaments. The white, like the yolk, was a little more fluid than usual. The white glass-like substance,[26] which is commonly held to be the semen of the cock, was a little harder.

No change in the albumen was detected on the third day;[27] but the sanguineous point or globule previously found in the yolk, but now found rather in the albumen,[28] manifestly pulsated[29] and, as we were able to judge by the color, gave rise to one venous trunk which, after dividing into two,[30] gave off many small branches which encircled the pulsating point. These small branches were supported by a very thin membrane which represented the secundine[31] both in function and substance. Hence three membranes were found here; the first[32] is assigned to the shell, the second[33] to the whole substance of the egg and the third to the secundine.[31]

On the fourth day I opened the egg from the blunter end and there occurred first a space so empty that it easily admitted the first joint of the finger. The aqueous white, on account of its tenuity, flowed off. The globule and the other structures were found to be larger. Moreover, the globule pulsated; the vessels did not. On one side,[34] three translucid, glass-like globules were found joined to one another. On the other side there were two branches or vessels,[35] not unlike arteries; which, however, did not pulsate. When the albumen had been poured off, the rather liquid yolk came into view. It was besprinkled here and there indiscriminately with blood.

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* Part I appeared in the July issue of the ANNALS OF MEDICAL HISTORY, n.s. 5:327, 1933.

On the fifth day we observed that the second membrane, surrounding the whole substance of the egg and perfused with many veins,[36] was so free from the shell-membrane and so strong that, without injury, it could be removed together with the substance of the egg. When this membrane was opened, I saw that the sanguineous, pulsating globule had sunk more deeply than usual. I took an egg of the fifth day from each hen. There appeared in one of them merely the still formless pulsating globule which was, however, surrounded by blood vessels, as has been stated. The lateral globules[37] tended to be black in color. Between them there were still smaller connected globules,[38] which represented the brain after a fashion. The third globule[39] was unchanged except in size. In the albumen dissimilar parts were seen. Some were thin and approached glossy whiteness, others were denser. The yolk was easily mixed with the albumen. In the other egg the head of the chick clearly appeared very large with respect to the size of the body. On both sides of it there was a blackish eye, which was found to be very clear in the middle. Between the eyes there was a third globule.[40] The rest of the rather long body hung down from the head. The heart or pulsating disc was situated not far from the head. From it the veins were seen to arise. I was able to find no trace of the liver, so confused were the viscera.

On the sixth day, in addition to the other parts which were all larger, we saw from the blunter end, after the . . . [41] of the membranes or pellicles, the albumen first, for the yolk remained in the bottom of the egg. The living, animate chick, imperfectly delineated in all its parts, floated in the albumen.[42] It had been granted a head which was very large in proportion to the body. There was nothing more perfect or larger than the eyes. For, although I had some difficulty, I was able to distinguish from one another all the tunics and humors in the eyes. Hence from the fact that in birds the eyes are developed first, Lactantius Firmianus[43] decided, not without reason, that the head begins to develop first in birds. Perhaps the eyes, just as very ingenious and elaborate instruments, require a long time for completion. Wherefore, since birds remain in the egg for a short time, the creator of things commences to weave this fabric first with the eyes. Furthermore, superiorly between the eyes there was a rather large, transparent globule which has been seen to represent the brain. Below the eyes there was something resembling a beak.

On the seventh day everything could be seen more clearly; first, the three pellicles, especially the third called the secundine[44] which supports the veins and surrounds all the fluid. When the yellowish white fluid had been poured off, the small, rudely-formed animal appeared. Its head was larger and more perfect than the other parts of the body. Both the cranium and the beak were observed to be more perfect. The rest of the body and its members were formless. I was able to distinguish almost none of the viscera both because they were included in the thorax and because internally they had not yet attained their true and manifest form, for they were seen to be in disorder everywhere.

On the eighth day I found that all parts including the legs and wings were larger and better formed, so that the embryo already exhibited the likeness of a chick. It moved around in the albumen[45] with more vigorous motion. In addition I found rather conspicuous veins[46] entering the umbilicus of the chick.

On the ninth day I observed that the secundine[47] had increased with respect to the number and size of its veins. In short, it was more distended with blood than usual; some very thin blood had even transuded. After the secundine, the chick was visible floating in the white with half of the yolk on each side as if the yolk had been cut into two equal parts.[48] The umbilical vessels were much larger. After the chick had been taken out, I removed the proper membrane[49] immediately surrounding the chick so that it might not perish in the liquid. The chick was now perfect in all parts and it was observed to have large pores everywhere, from which the primordia of feathers were about to emerge. The head was largest of all. The eyes were very perfect indeed and provided with lids. I saw three transparent globules in the head, the combination producing the form of the avian brain. All parts below the neck had attained their complete and natural form. A pulsation appeared externally in the thorax in the region of the heart. The heart had attained its form and was whitish in color. Moreover it beat for a long time outside the chick.[50] The rather pale liver, the stomach, the intestines, the ribs and all the other viscera were found to be very soft and flaccid. There were two albuminous substances and each was surrounded by its own individual membrane.[51] One portion[52] was transparent and contained the chick swimming in it. The other, viscous, dense and pale, the excrementitious portion of the albumen, as it were, remained in the bottom of the egg.

An egg of the tenth day had a secundine[53] somewhat stronger than usual and veins bedewed with blood on the outside. The fetus, which lay upon the yolk as on a couch, was perfect in all its parts. The legs, the back and the buttocks were covered with the primordia of feathers. The body or belly of the chick was now larger than the head. Aristotle[54] states the contrary. In the eyes I saw all the tunics, all the humors, and the external covers or lids as well as the membrane with which they wink.[55] The brain had its convolutions and gyri. The heart, indeed, had its natural form and was white in color like the spermatic parts.[56] The lung and the ribs were formed. In the lower part of the belly were the liver which tended from white to reddish in color, the stomach and the intestines which were very white. Two umbilical vessels[57] emerged from the belly of the fetus next the anus and proceeded to the yolk. When the chick had been removed, we noticed that the greater part of the albumen had been used up and what remained was a dense excrement. Little of the yolk, however, had disappeared.

On the eleventh day we found no difference except in size. The head had grown more evident and the feathers had sprouted a little. The fetus, resting upon the yolk, floated in a white and tenuous albumen.[58] The dense and viscid albumen adhered below the yolk.

On the twelfth day, in addition to other things we examined the membranes and humors. There were four membranes. The first[59] was fused with the shell for the sake of strength, for so strongly does it hold the very fragile shell together that a fresh, even a raw egg, cannot be broken by even the strongest man if the pointed ends are compressed by both hands. The second membrane[60] surrounds the entire substance of the egg. It is depressed and contracted for the diminution and contraction of the egg. In this way it prevents the mingling of parts of the egg which could easily be brought about by shaking since everything becomes more liquid during incubation. The third membrane[61] affords a support for the veins and arteries, for it is full of arteries and veins. Moistened externally by tenuous blood, it surrounds the whole egg and performs the function of the secundine. The third membrane is followed by the membrane[62] proper to the chick, which contains not a little water in addition to the chick. It seemed to me that this tunic or membrane is dilated next to the umbilicus and that it invests the umbilical vessels. As for the chick, it was larger and more solid and was covered with larger feathers. Something white adhered loosely to the end of the upper and lower bill.[63] Women say that this prevents the picking of grain and for this reason they remove the white substance as soon as the chicks have hatched.

On the thirteenth day we saw that the substance of the egg was diminished in quantity. The chick was larger and more completely feathered. Besides these things there was nothing extraordinary.

On the fourteenth day the chick had grown in proportion to the degree to which the albumen had disappeared. It was entirely covered with small feathers. The transparent, dense and viscous fluid, smaller in quantity than usual, was contained in its own membrane[64] just as the yolk was contained in a pellicle[65] full of vessels. The umbilical vessels seemed to me to be five in number. One vein[66] ran to the third membrane or secundine[67] to which it supplied many branches, but two other veins[68] were distributed throughout the tunic investing the yolk. In addition to these veins, I found among the umbilical vessels two small arteries which, coiled like worms,[69] extended to the yolk. I was unable to observe their attachment.

On the fifteenth day the vessels were scattered everywhere through the secundine.[70] They had tunics so thin that they were injured by slight contact with the knife. Very red, thin blood flowed out. These vessels or veins proceeded from one rather thick trunk,[71] which extended for a long distance through the middle of the chorion.[72] When the secundine was cut open, no little watery serum flowed out. Then there came into view the vesicle or membrane[73] in which the fetus lay floating in water, and likewise the yolk, covered by its own membrane. This membrane was fused to the secundine just as in the human fetus the amnion is fused to the chorion.[74] The vitellus was clearly divided into two parts which cohered for half a finger's breadth, but for both parts there was one membrane[75] which arose from the umbilicus or skin of the chick. The rest corresponded to what has already been described.

On the sixteenth day I saw that the dense and viscous portion of the albumen had been used up almost everywhere and that the branch of the pulsating artery was distributed throughout the membrane surrounding the yolk. The membrane of the chick and of the yolk were the same as formerly. Other things which should have grown were observed to be larger; those which should have diminished in size were seen to be smaller. Among other things, the belly was much more swollen and thicker than usual. Within the belly, the viscera had grown very much. In the stomach I found a chyle-like substance, the major portion of which, however, was in the end of the esophagus next to the stomach. Two worm-like vessels which resembled intestines rather than arteries, hung down outside the belly.[76]

On the seventeenth day I saw an aqueous substance, scanty in amount both between the third and fourth membranes[77] and between the fourth and the chick.[78] And then I saw emerge from the umbilicus one artery, three veins[79] and an outgrowth[80] from the intestines to the yolk. Two of the veins entered the mesenteric veins. The third went to the vena cava. The large artery, passing by the stomach opened into the heart as I saw at times. I saw the intestines hanging out of the umbilicus[76] for some distance and passages[81] extending from the intestines to the yolk of the egg. Very hard, shell-like feces were observed between the fourth membrane and the chick. In the stomach some chyle, mixed with water was found. No little yolk had been drawn into the belly. Its disposition and location corresponded to the description of Aristotle.[82]

On the eighteenth day I noticed some true excrement from the chick between the fourth membrane and the chick. The fourth membrane[83] surrounded the yolk and the chick. The chick was completely feathered and pot-bellied. When the membrane belonging to the chick was separated I found that the membrane proper to the yolk[84] was filled with many veins and that in its middle portion it had been pulled into the belly together with the yolk, now drawn out in length. The viscous white substance which has been mentioned was entirely used up. Within the chick, the stomach, which had grown very much, contained a little aqueous fluid and a great deal of a white, cheesy substance which we thought was chyle. Some such substance, indeed, flowed from the intestines.

On the nineteenth day the head of the chick was bent down and concealed under the right wing and leg. The aqueous fluid had diminished everywhere. Between the fourth tunic and the chick there were encountered true feces as well as a watery fluid with which the whole chick was wet. The membrane of the yolk[85] was clearly seen to arise from the skin of the chick. The yolk was seen, by the contraction of this membrane, to be drawn inside and absorbed;[86] indeed it had now been almost absorbed. In addition to this improper membrane,[85] the yolk had also a proper one[87] filled with many veins and arteries. We saw in the belly the things which we had seen before but they were more perfect. I found no yolk in the intestines (as Albertus Magnus[88] would have it). The chick already had testes and a comb, for it was a cock. Furthermore, we heard peeping.

On the twentieth day the chick was fully formed. Within the shell were found four membranes[89] or tunics attached to one another at one place. The inner two[90] of these membranes contained many veins and arteries. As for the chick, we saw three umbilical vessels inside. Two of these seemed to be arteries, one a vein.[91] The umbilical opening was closed, but it could easily be opened when a probe was introduced. When the opening was dilated with a knife, the yolk emerged invested with its own membrane and drawn out in length. There was a smaller amount of yolk than at the beginning. It was joined to the intestines by means of a canal[92] prolonged from them. The umbilical artery, which was mentioned in an egg of the seventeenth day was observed to pulsate much more clearly than before, and to open into the heart.[93] Two veins[94] joined branches of the portal vein far from the liver. From the stomach, when cut open, there flowed out chyle which was much yellower than usual, and a little water. Water flowed from the crop and greenish feces from the rectum. The color of the liver tended to be yellow rather than reddish. The lung was reddish.

NOTES (CONTINUED)

17. See Hippocrates,[114] t. 7, p. 531: "Take twenty or more eggs, and give them to two or several hens to cover; then each day from the second to the last, that of hatching, remove an egg, open it and examine it; you will find that everything conforms to what I have said, insofar as one can compare the nature of a bird to that of man."

There can be little doubt that the foregoing passage inspired the researches of Aldrovandus, who quotes it and after referring to the divergent views of Aristotle and Galen says: "In order to obtain the truth regarding this trivial controversy between physicians and philosophers, with the greatest diligence and curiosity I dissected daily one of twenty-two eggs which were being incubated by a hen and I found that Aristotle's doctrine is very true . . ." (Ref. 96, vol. 2, p. 216.)

As pointed out in the Introduction, Coiter was doubtless influenced by this passage from Hippocrates, either directly or through Aldrovandus.

18. As Bloch[102] points out, this was a question with which the early writers on generation were deeply concerned. Unfortunately their conclusions were too

frequently influenced by purely philosophical considerations and often not based upon observation. Thus Alcmaeon of Croton is quoted as having said that the head arises first during development because it contains the brain, the seat of the soul (Wachtler,[138] pp. 66–67). Similarly, Censorinus[103] states that Anaxagoras taught that the brain, the seat of sensation, appears first (Censorinus, vi). According to Censorinus the belly and the head "because they contain the most void" were held to appear earliest in development by Democritus but Plutarch attributes to him the doctrine that the navel is the first structure to appear (Plutarch,[126] cap. iii); and Aristotle[97] (740*a*) states that he held that the external parts precede the internal parts in development. Hippon was another adherent of the doctrine of the primacy of the head in development (Censorinus vi). Somewhat later, Lactantius states "in the fetuses of birds, however, there is no doubt that the eyes are formed first as we have often observed in eggs. Whence, I think that it cannot be otherwise than that development begins with the head." (Ref. 119, p. 78.)

Empedocles was the first to teach that the heart arises first because it contains life in the highest degree (Censorinus, vi).

In the Hippocratic treatise "On Regimen" it is stated that all the parts of the fetus are simultaneously formed (Ref. 114, t. 6, p. 499, ¶26) but the "De Carne" describes the formation of the organs in purely arbitrary sequence (see Bloch,[102] p. 227ff.).

According to Aristotle, " . . . in the embryo all the parts exist potentially in a way at the same time, but the first principle is furthest on the road to realization. Therefore the heart is first differentiated in actuality. [Ref. 97, 740*a*.]

"After this, as said already, the internal parts come into being before the external. The greater become visible before the less, even if some of them do come into being before them. First the parts above the hypozoma are differentiated and are superior in size; the part below is both smaller and less differentiated. [Ref. 97, 741*b*, 25.]

" . . . that part which contains the first principle comes into being first, next to this the upper half of the body. This is why the parts about the head, and particularly the eyes, appear largest in the embryo at an early stage, while the parts below the umbilicus, as the legs, are small . . . " [Ref. 97, 742*b*.]

"The bones, sinews, hair, nails, hoofs and the like are the last parts to assume their form." (Ref. 97, 744*b*.)

Pliny's account leans heavily on Aristotle's teaching (Ref. 125, lib. x, c. 53) but Galen asserts (Ref. 110, vol. 4, pp. 662–664) that the heart arises after the liver.

Avicenna's account (see de Koning,[99] pp. 754–764) is rather confused: "the first thing formed which shows distinctly is the umbilicus, but the swellings of the heart, liver and brain precede the formation of the umbilical cord, although the complete formation of these three organs takes place after the complete formation of the substance of the umbilical cord . . . The truth is that the first organ to form is the heart."

Albertus Magnus is influenced by both Aristotle and Avicenna, affirming that three vesicles for the heart, liver and brain arise in the order stated (Ref. 95, lib. 9, tr. 2, cap. 4: 117, p. 721).

Aldrovandus (Ref. 96, vol. 2, p. 217) and Coiter both describe the early origin of the heart but Fabricius characteristically argues (Ref. 107) that the skeletal system (the vertebral column, cranium and ribs) arises first because the other parts are supported by it. Next appear the brain and spinal cord and later the heart, liver, etc.

Harvey (Ref. 112, p. 373) believes that the blood is first formed, preceding the formation of the heart which appears almost immediately after the blood.

And so the argument continues. In the latter part of the seventeenth and throughout the eighteenth centuries the preformation doctrine enthralled some of the greatest minds and the problem of the primacy of the parts naturally lost its importance. Not until the middle of the nineteenth century, and then only through the combined labors of Wolff, Pander, von Baer, Reichert, Rathke, Schwann, Bischoff, Remak, Kölliker and others were the early stages of development properly interpreted.

19. Coiter probably means an egg opened after a few hours of incubation, very likely not more than twelve. Here we have the first published description of the blastoderm. The "white circle" probably refers to the area pellucida; the "point or disc" in its middle may refer either to the nucleus of Pander or, more probably, to the rather diffuse thickening which marks the appearance of the primitive streak. The two circles (see note 20) probably are the area vitellina interna and externa. Erdl (Ref. 106, Bd. 1, Taf. 2, Fig. 1.) has a beautiful figure of the blastoderm after ten hours of incubation illustrating these structures. Coiter's description might well be applied to it.

The germinal disc or cicatricula of the unincubated egg is not mentioned by Coiter, although it is rather vaguely referred to by Aristotle when he says "the principle of the male is separated off in eggs at the point where the egg is attached to the uterus" (*meaning the ovary*). It was called the *cicatricula* by Fabricius, who regarded it as a sort of scar, representing the point of attachment of the egg to the peduncle (Ref. 107). According to Fabricius it plays no role in the formation of the chick.

Parisanus,[124] whose treatise I have been unable to examine because of its extreme rarity, is said to have observed the cicatrix and stated that the chick arises from it. He interprets it as the semen of the cock. (See Harvey,[112] p. 227.)

Harvey refutes Parisanus as to the seminal nature of the cicatrix and is the first to have recognized clearly its very early appearance and traced its history systematically. He correctly states that it is not a scar marking the site where the peduncle has been severed and not the semen of the cock but that it can be observed from very early stages of the egg in the ovary; that it is, in fact, "the most important part of the whole egg, and that for whose sake all the others exist; it is that, in a word, from which the chick takes its rise." (Ref. 112, p. 215.)

Although not mentioned by Aldrovandus or Fabricius the circles surrounding the area pellucida referred to by Coiter are often mentioned in seventeenth century descriptions of the blastoderm, but the number described by different observers varies. Under favorable conditions, it is possible that four such circles or areas might be seen in the early blastoderm, namely (1) the area vitellina interna and (2) the area vitellina externa and, as parts of the latter, (3) the germ wall and (4) the margin of overgrowth. Somewhat later, the mesodermal area or area vasculosa might be seen. It is, however, very hard to interpret early observations in the light of modern knowledge.

Parisanus is said by Harvey (Ref. 112, p. 233) to have described "a honey-colored, a white, a gray, and another white circle." These might easily refer to the four areas just mentioned.

According to Harvey (Ref. 112, p. 230), "On the second day of incubation . . . the cicatricula in question is found to have enlarged to the dimensions of a pea or lentil, and is divided into circles, such as might be drawn with a pair of compasses, having an extremely minute point for their center." And again, "The second day gone by, the circles of the cicatricula . . . have become larger and more conspicuous . . . By these rings the cicatricula is indistinctly divided into two, occasionally three regions, which are frequently of different colors . . . " (Ref. 112, p. 232.)

Harvey, however, was mistaken in his interpretation of the relation of the chick to the blastoderm. According to him the chick is formed in the subgerminal fluid (*colliquament*) which he confused with the amniotic fluid. The blastoderm, according to Harvey, represents the amnion. (Ref. 112, p. 233ff.) The descriptions of Highmore,[113] Langly[120] and Steno[134] are also of interest in this connection but limitations of space will not permit citation.

20. This is a difficult sentence to interpret. Coiter says, “Ex circulo fluebant duo germini, quorum alter crassior et longior altero existebat.” The form *germini*, regularly the dative singular of *germen*, makes no sense, and from the context a nominative plural should, probably, follow duo. I have assumed that *germini* is a misprint for either *germina* or *gemini*. In the first case the rendering would be: “From the circle two offshoots flowed”; in the second, “From the circle two twin (circles) flowed,” or more freely, “two identical or similar circles.” I believe the latter interpretation is correct. It is interesting to note that Schoock, in his “Dissertatio de ovo et pullo,” 1643, paraphrases this sentence of Coiter's as follows: “Ex circulo dicto, duo alii fluunt,” i.e., “From the said circle, two others flow.”

21. That is after about twenty-four hours of incubation. Cf. Aldrovandus, who begins his description of the development of the chick on the second day: “On the second day of incubation I observed that the yolk was brought toward the sharp end [*of the egg*], altered in some way and rather white in the middle, a circumstance, which Aristotle particularly does not mention.”

22. The external shell membrane.

23. The inner shell membrane.

24. Aristotle (Ref. 98, 561*a*). Another point about which there was much controversy. Harvey says, for example: “Aldrovandus, adopting an error akin to that of Aristotle, says besides, that the yolk rises during the first days of incubation into the sharp end of the egg, a proposition which no eyes but those of the blind would assent to . . . ” (Ref. 112, p. 227.) In the early part of incubation the yolk would naturally rise to whatever end of the egg happened to be uppermost when opening the egg.

25. The primitive streak?

26. Coiter refers to the chalazae. These were as he says, generally regarded as being formed by the semen of the cock as the name treadle (*galladura, Ital.*) testifies. They were described by Aristotle (Ref. 98, 560*a*, 25–30) who very properly says they contribute in no way to generation. He, of course, does not regard them as of seminal origin. Albertus Magnus (Ref. 95, lib. 6, tr. 1, cap. 2: 13) states that the semen of the male may be found in the egg as a viscid, white substance extending through the albumen to the yolk. He is apparently describing the chalazae. Aldrovandus makes the same error: “This [the chalaza] Aristotle thinks contributes nothing to generation, which seems to gainsay the truth, since eggs which lack it are all infertile; I therefore think that it is the same as the sperm.” (Ref. 96, vol. 2, p. 209). Fabricius denies that the chalazae represent the semen of the cock (Ref. 107, pp. 30, 34) and states that they represent the material from which the chick is formed because there are only three things in the egg from which the chick could be formed, namely the yolk, the albumen and the chalazae; since the albumen and yolk serve as nutriment, therefore the chalazae must form the chick. He recognizes, however, that there are a number of objections to this conclusion, among which are: (1) the chalazae seem to function as ligaments; (2) they are found in both ends of the egg; (3) the chalaza found in the obtuse part of the egg where he believed the chick to be formed is too small to provide enough material for the chick.

Fabricius is refuted by Harvey, who points out that the chalazae “are mere appendages of the albumen and vitellus . . . the extremities of certain membranes, twisted and knotted; they are produced in the same way as a rope is formed by the contortion of its component filaments.” (Ref. 112, p. 329.) He interprets them as ligaments serving to stabilize the yolk. He also, quite correctly, holds that the cicatricula, from which the chick arises, lies midway between the chalazae, and that the nodes of the latter bear no resemblance to the fetus as Fabricius maintains.

It is interesting to note that Wolff (Ref. 142, p. 87) was almost misled by the chalazae. He reports that he at first sought for the embryo in them.

We now know that the chalazae are not properly membranes but simply the denser, spirally-wound portion of the albumen.

27. After about forty-eight hours of incubation.

28. Coiter refers to no "sanguineous point" on the second day; he probably thought that the "point" (probably the primitive streak) described on the second day became the "sanguineous point" on the third.

It is hard to understand what he means by "formerly found in the yolk, but now rather found in the albumen."

Harvey comments as follows: "Volcher Coiter has these words: 'the sanguineous point or globule, which was formerly found in the yolk, is now observed more in the albumen, and pulsates distinctly.' He says erroneously 'formerly found in the yolk,' for the point discovered in the vitellus is white, and does not pulsate; nor does the sanguineous point or globe appear to pulsate at the end of the second day of incubation. But the point which we have indicated in the middle of the circle, and as constituting its center in connection with the vitellus, disappears before that point which was characterized by Aristotle as palpitating, can be discerned; or, as I conceive, having turned red, begins to pulsate. For both points are situated in the center of the resolved fluid, and near the root of the veins which thence arise; but they are never seen simultaneously: in the place of the white point there appears a red and palpitating point. That portion of Coiter's sentence, however, where he says: 'the *punctus saliens* [Coiter says sanguineus] is now seen in the albumen rather than in the yolk' is perfectly accurate." (Ref. 112, p. 236.)

The following passage from Harvey explains the foregoing and helps to shed light on the possible meaning of Coiter's statement: "Within the circles of the *cicatricula*, I say, there is contained a quantity of perfectly bright and transparent fluid, even purer than any crystalline humour; which if it be viewed transversely and against the light, the whole spot will rather appear to be situated in the albumen than sunk into the membrane of the yolk as before: it presents itself as a portion of the albumen dissolved and clarified, and included within a most delicate *tunica propria*. Hence I entitle this fluid the *oculum seu colliquamentum album;* it is as if a portion of the albumen, . . . formed a more spiritous and better digested fluid, separated from the rest of the albumen by a *tunica propria*, and situated between the two masses of liquid, the yolk and the albumen." (Ref. 112, p. 232.)

Harvey's *colliquamentum* refers no doubt to the fluid which collects in the subgerminal cavity and causes the blastoderm to become somewhat separated from the yolk. According to Harvey the embryo is formed in the colliquament and is invested by the *tunica propria*, by which the blastoderm is to be understood.

Coiter probably makes a similar error, regarding the blastoderm at first as a part of the yolk and later, interpreting the subgerminal fluid as albumen, thinks of the "sanguineous point" as lying in it. This interpretation is supported by Coiter's description of two albuminous substances on the ninth day. One portion is described as transparent and as containing the chick.

29. Compare Aristotle: "with the common hen after three days and three nights there is the first indication of the embryo; . . . Meanwhile the yolk comes into being, rising towards the sharp end, where the primal element of the egg is situated, and where the egg gets hatched; and the heart appears like a speck of blood, in the white of the egg. This point beats and moves as though endowed with life, and from it two vein-ducts with blood in them trend in a convoluted course (as the egg substance goes on growing, towards each of the two circumjacent integuments); and a membrane carrying

bloody fibers now envelops the yolk, leading off from the vein-ducts.” (Ref. 98, 561*a*.)

Aristotle, therefore, believes that the heart begins to beat on the fourth day, i.e., after about seventy-two hours of incubation. Aldrovandus, like Coiter, describes the *punctum saliens* on the third day (Ref. 96, vol. 2, p. 217), but Harvey does not mention it until the fourth as “a leaping point, of the colour of blood, so small that at one moment, when it contracts, it almost entirely escapes the eye, and again, when it dilates, it shows like the smallest spark of fire.” (Ref. 112, p. 235.)

30. The vitelline vessels.

31. Coiter here refers to the yolk sac.

In order to understand Coiter's description of the fetal membranes, it is necessary to know something of their history and the nomenclature used by the ancients in describing them. In the Hippocratic treatise “De natura pueri” (Ref. 114, t. 7, p. 497) the development of the fetal membranes is only vaguely described and the word chorion (χόριον) is apparently to be understood as applying to the entire afterbirth, but the amnion and, of course, the allantois and yolk sac are not mentioned.

The amnion, according to Rufus of Ephesus (Ref. 127, p. 166), was named by Empedocles.

In Aristotle we find, among others, the following pertinent passages. “And first of all the animal develops within the innermost envelope, and then another membrane appears around the former one, which latter is for the most part attached to the womb, but it is in part separated from it and contains fluid.” (Ref. 98, 586*a*, 25–30, cf. also Ref. 97, 746*a*.)

In describing the membranes of the chick, he says “A membrane [the allanto-chorion] with a liquid resembling serum envelops the entire structure. Then comes another membrane [the amnion] right around the embryo, as has been described, separating it off against the liquid. Underneath this comes the yolk, enveloped in another membrane [the yolk sac] . . . ” (Ref. 98, 561*b*.)

“And about this time [the twentieth day] is plain to be seen the membrane resembling an afterbirth [the allanto-chorion] that comes next after the outermost membrane of the shell, into which membrane the one of the navel strings [allantoic stalk and vessels] was described as leading (and, by the way, the chick in its entirety is now within it), and so also is the other membrane resembling an afterbirth, namely that surrounding the yolk [the yolk sac], into which the second navel string [the yolk stalk and vitelline vessels] was described as leading . . . ” (Ref. 98, 562*a*, cf. also 561*b*.)

Aristotle therefore describes the following in the bird egg, namely the allanto-chorion (or serosa), the amnion and the yolk sac; the allantois and chorion are not differentiated but collectively described as resembling an afterbirth, probably because of their vascularity. For a similar reason the yolk sac is described as resembling an afterbirth. The mammalian chorion and amnion are clearly described by Rufus of Ephesus (Ref. 127, p. 166) and Soranus of Ephesus (Ref. 130, Kap. 17, p. 40). The latter says that the chorion is frequently called the afterbirth because it follows the embryo at birth.

The chorion, amnion and allantois, probably of some domesticated mammal, are clearly described by Galen (Ref. 110, t. 2, pp. 137–138). But he uses only the term χόριον in describing the afterbirth. (Ref. 117, p. 473; Ref. 109, vol. 5, p. 557.)

The term *secundae*, or, less properly, *secundinae* is used by Celsus and Pliny to apply to the afterbirth and the *secundinae* are described by Avicenna as consisting of three panniculae: the chorion, amnion and allantois (Ref. 117, p. 472). The word long continued to be used as applied to all the membranes and the placenta. From it is, of course, derived the English secundines, applied to all the membranes of the afterbirth.

The term *secundina* is usually used by Coiter to apply to the allanto-chorion of the chick but by transference is also used for the yolk sac, since it, too, is vascular. This is the case in the present instance. We have also noted (*vide supra*) that Aristotle refers to the yolk sac as resembling an afterbirth.

It should, of course, be appreciated that the human allantois and the mammalian yolk sac were not correctly described and interpreted until relatively recent times, but a discussion of this latter point would not be pertinent here.

32. Outer shell membrane.

33. Inner shell membrane.

34. The embryo at this time lies on its left side. Due to the rapid forward growth and bending of the brain it lies largely above and to the right of the heart. (See Erdl's[106] Fig. 15, Taf. 2 and Lillie's[121] Fig. 121.) Early on the fourth day (i.e., after about seventy-two hours of incubation), the head would probably lie some distance above the origin of the vitelline arteries (cf. Lillie's Fig. 99), so that Coiter's statement that the brain vesicles were found "on one side" and the vitelline vessels on "the other side" may possibly be explained on the basis of this fact.

35. The vitelline vessels.

36. The allanto-chorion together with the inner shell membrane.

37. The eyes.

38. The brain vesicles.

39. It is not clear to what this refers.

40. The brain.

41. The text reads: "Sexto die praeter reliqua, quae omnia fuere maiora, vidimus ab obtusiore parte post membranarum sive pellicularum primo albumen . . . " Since membranarum sive pellicularum can hardly be governed by post, I have assumed that there is some omission here.

42. Coiter confuses the albumen and amniotic fluid. See note 28.

43. Lactantius (Ref. 119, p. 78). See note 18.

44. Here the allanto-chorion.

45. Not really the albumen, but the amniotic fluid. See note 28.

46. The allantoic and vitelline vessels.

47. The allanto-chorion.

48. The yolk sac becomes somewhat bilobed.

49. The amnion.

50. Coiter probably removed the heart and observed its beating after removal. In his "Observationum anatomicarum chirurgicarumque miscellanea," etc., he states that he removed the hearts of cats, vipers and lizards and describes their motion after excision.

51. That is, the amniotic fluid contained in the amnion and the albumen in the albumen sac. (See Lillie,[121] p. 224.)

52. The amniotic fluid.

53. The allanto-chorion.

54. Aristotle (Ref. 98, 561*a*, 25–30).

55. The nictitating membrane, of course.

56. According to Galen the liver and other viscera are formed from blood, the whitish, elastic structures like membranes, nerves, vessels and the brain arise from semen (Ref. 102, p. 49).

Cf. Galen (Ref. 109, vol. 4, p. 551): "Omnia enim, quae sunt carnosi generis, ex sanguine generata sunt; membranosa vero omnia ex semine ortum habent."

Also (Ref. 109, vol. 4, p. 658) "Quaecunque tamen albae et exangues partes sunt, non ex ipso sanguine, ut jecinoris substantia, procreari possunt."

See also Harvey (Ref. 112, p. 255): "Meantime we may be permitted to smile at that factitious division of the parts into spermatic and sanguineous; as if any part were produced immediately from the seminal fluid and all did not spring from the same semen."

57. The vitelline artery and vein.

58. The amniotic fluid.

59. The external shell membrane.

60. The internal shell membrane.

61. The allanto-chorion.

62. The amnion.

63. The egg tooth, which, however, is placed on the upper bill only. Aldrovandus probably discovered it, although his description was not published until after Coiter's. In his description of the eleventh day of development Aldrovandus says: " . . . there was something white, cartilaginous and rather hard on the end of the upper beak, which was more conspicuous on the thirteenth day. It was moreover round and not dissimilar to a millet-seed. Nature, the very wise parent of things

seems to have formed it there to prevent the venules, small membranes or any other small structures in its bill from being perforated. Women say that chicks when born cannot take food unless it is first removed." (Ref. 96, vol. 2, p. 218.)

64. The albumen sac.

65. The yolk sac. Cf. Aristotle (Ref. 98, *561a*, ff.).

66. The allantoic vein.

67. The allanto-chorion.

68. The vitelline vessels, probably the artery and vein.

69. Very likely the intestines, rather than arteries. See Coiter's description of the sixteen-day chick.

70. The allanto-chorion.

71. The allantoic vein.

72. Coiter uses the term chorion only twice. He usually calls the allanto-chorion the secundine.

73. The amnion.

74. Cf. Lillie,[121] p. 223. See note 89.

75. The yolk sac, which, however, is attached to the gut by way of the yolk stalk and does not arise from the umbilicus or skin of the chick.

76. In the chick the intestinal loop projects into the umbilical cord after about the fifth day. The intestines are gradually retracted into the abdominal cavity during the seventeenth and eighteenth days.

77. The allantoic fluid.

78. The amniotic fluid.

79. One would probably find five blood vessels in the umbilical cord of the chick at this time: (a) the left allantoic vein, (b) the left allantoic artery, (c) the smaller right allantoic artery, (d) the vitelline vein, (e) the vitelline artery. The fact that Coiter found but four vessels may, possibly, be due to the fact that he overlooked the small right allantoic artery which, however, may actually disappear before this time. The identification of the vessels mentioned by Coiter is difficult, but if the foregoing assumption is correct it is possible that he mistook the allantoic vein for an artery, although he later (twentieth day) says that it pulsated. The two so-called veins described as entering the mesenteric veins may really be the allantoic and vitelline arteries, which actually join the dorsal aorta. The vein described as entering the vena cava is probably the vitelline vein which actually joins the hepatic portal. Baudrimont and St. Ange (Ref. 101, Pl. VI, Fig. 3) give an excellent figure of the circulation in a fifteen day chick. A study of it shows how easily Coiter might have made the mistakes he did. Compare Harvey's statement (Ref. 112, p. 260).

80. The yolk stalk. It was described by Aristotle (Ref. 98, *562a* 5; Ref. 97, *753b* 20), but after Coiter, not described by Aldrovandus, Fabricius or Harvey, although some of Fabricius' figures apparently show it. It was rediscovered by Steno[132] in 1664 and described also by Needham in 1667 (Ref. 123, pp. 94–97) who states that he had already observed it in 1654 and had demonstrated it to several friends. (See Steno,[131] vol. 1, p. 263.)

81. The yolk stalk is usually thought of as a single passageway from the yolk sac to the intestines. Steno[132] and Needham[123] also speak of passages but it is possible that all these observers mistook blood vessels for communications between the yolk sac and intestines. Coiter speaks once of "an outgrowth from the intestines to the yolk," and again of *a* canal prolonged from the intestines. The text here, however, clearly calls for passages.

82. Aristotle (Ref. 98, *562a* 5 ff.).

83. The amnion, which expands down over the yolk sac.

84. The yolk sac.

85. No doubt the amnion which has expanded so as to cover the yolk sac. Cf. Lillie (Ref. 121, p. 230).

86. This is actually the case, but the allantois also plays a role. See Lillie (Ref. 121, p. 230).

87. The yolk sac.

88. Albertus Magnus: (Ref. 95, Lib. vi, tract 1, cap. 4: 37.)

89. Probably the (1) inner and (2) outer shell membranes, (3) the inner layer of the allantois fused with the amnion and (4) the outer layer of the allantois fused with the chorion. The latter two

are fused in the region of the so-called yolk sac umbilicus.

90. The inner layer of the allantois and the allantochorion.
91. Coiter is inconsistent. He formerly described only one artery among the four vessels which he found in the umbilicus (See note 79). A few lines further on, he again speaks of "the umbilical artery which was mentioned on the seventeenth day . . . "
92. The yolk stalk. See note 81.
93. See note 79.
94. Possibly the mesenteric and the vitelline veins.

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WILLARD PARKER

By JOHN RUHRÄH, M.D.

BALTIMORE, MD.

PART III. CONCLUSION*

30. Sunday. This makes another day I have spent of the Lord in this city. No one can conceive of the habits & peculiarities of the French People. They are economical, never drunk and not *quarrelsome* but for the light and gay amusements they cannot be surpassed and probably are not equalled. This morning visited the La Charité. On my return from that I visited a Church, induced to do it from seeing a coffin carried to it. Strange what ideas these people have.

1. The coffin is covered by a black pall, lights burning upon cofin & a cross *with Christ*. The cofin was exposed at the Door of the House. Every one that passes the dead must raise his hat as he passes. "The Drivers" are men of Function with a chapeau bras & trimmings. After this cofin was carried to the church. It was exorcised then was brought in another of young woman unmarried, hence white pall & a chaplet of white roses upon it. We came home. Breakfasted (cafe au lait) we then, Friend St. John & myself, concluded we would go out that we might see these people on Sunday. We passed to the Bank of the Seine and passed down the River by the Palais du Roi Romain, the Chamber of Deputies. Palais de Bourbon, Hotel des Invalids & the Champ de Mars. This is a grand open field where military Parades are now held, here Louis 16th held the great fete in 1790, here Napoleon held his Review previous to the Battle of Waterloo. It is a Parallelogram—4 rows of Trees on East & West side. North is the Ecole Militaire, the Field is for Mil'y. Here this day were horse races, several Thousand people were assembled. Everything arranged in ample order. Many of the Nobility were present, their carriages in Royal equipage. Saw 3 Races, the 2d was foil'd, the Horse fell, threw the Rider & injured him some. From this place we crossed the River by the Bridge of Iena, ascended a mound & had a magnificent view of the City. We visited the Triumphal Arch of Napoleon 150 ft. high, marble, much good sculpturing upon it (vid. Galignani). From this spot we came through the Champs Elysees & of all the sights for Sunday. Hosts of people. Theatrical exhibitions of all kinds mostly however low. *Flying horses ships*, Wheel swings, shooting Billiards, all kinds of games. Booths &c. &c. Music & a girl say 20 in Peasant's dress upon the back of Jill. *Astride.* She had a basket in her hand and was holding forth to the multitudes! Every other man is a soldier or an officer and in this way is order kept. I am inclined to believe that the Roman Catholic Religion is *no Religion.* It is a mere shew. This night there is a famous Ball at wh. the Royal Family are to be present.

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* Parts I and II appeared in the May and July issues of the ANNALS OF MEDICAL HISTORY, n.s. 5: 205; 376, 1933.

May 1. Monday. This is a very great day in France especially in Paris—the King's Fête. At 12 the King received company. It has been beautemps and all Paris is out. I never saw such an immense crowd as in the Tuileries, Place de Concorde—Champs Elysées. After passing round the palace of the King & seeing the multitude assemble I then sauntered through the Garden, it is splendid, the 4 fountains in full play. Men, women & children seem let loose to play. The men make fools of themselves by letting their hair and beards grow. The women are without any qualifications, the ugliest I have ever seen in my travels. They seem to be in their element this day—women just ready to present *somebody* with a living present are at every step—I was surprised! I began my walk through the Champs Elysées—a silent lonesome looker on in Venice. I in the midst of thousands was yet alone, knew nobody & nobody knew me. All kinds of games they have and more means to get money, than all the Yankees that ever was or ever can be will be able to devise. How the French love money!

1. Cake, Nut Tables.
2. Portable drink sitters—Singular!
3. A wise dog & master without legs, with a great crowd to hear the Dog talk.
4. Tumblers.
5. Un Batonnier—or stick player.
6. Man, woman & 3 children *tumbling*.
7. Puppets.
8. Electrical machine.
9. Trials at lifting by scale.
10. Jugglers, players, masqueraders.
11. Animals & Albinos.
12. Booths with all kinds of articles.
13. Shooting, coits, cooking, sailing & rotary swinging.
14. 2 theatres by the king situated opposite each other.

4 musical saloons opposite & at the side & in the center a smooth mast 60 feet well greased over & at its top is placed a gold & silver watch, silver spoons, cups, pipes and it is called Mat de Cocagne Est'd. in 1425. This pole is climbed & the one who first reaches the top takes the first prize. In the evening these groves were beautifully illuminated & there was dancing—at ½ past 7 there was a serenade in front of the palace. Louis Philipe came out upon the piazza 1—alone, 2d—with the Queen, 3d—with the Dukes, his reception by the crowd was cold. at ½ 8 the feu d'artifice were begun & their splendour surpassed conception. The crowd was beyond calculation. It was presumed that from 5 to 6 hundred thousand people were out—the evening was pleasant. Thus ended this sight-seeing day.

2d. Tuesday. This is the Birth day of my Darling Daughter, Kate, 5 of her sunny years have flown. If the will of God, may she live to see many and be distinguished for her goodness & usefulness. Oh thou knowest the prayer of thy humble servant—hear it in behalf of his dearly *beloved family*. Who can be more blessed than I, who have a partner, a wife dearer than life & two good affectionate (excuse parental partiality) and intelegent little

Daughters. This day I have been engaged in matters of the Profession. It is a task to acquire the French.

This forenoon I visited Sant. Sulpice, Magnificent Church. Some paintings of value but modern. The Madonna sculptured & standing in the choir in singular view.

3d. Wednesday. Hospital this morning and during the day have been rather inactive. Bot Madame Stork's work for Italy.

4. Thursday. This morning visited the Hospital. After my café au lait I visited the Galery of the Chamber of Peers. I was very much pleased with many of the paintings, they are modern. Some good specimens of statuary.

From the Galery we went to the Ch. of St. Sulpice—it is a massive building—*cross formed* like all the churches. Was begun about 200 years ago but not completed until 100 yrs. ago—it is a mixture of orders—Doric—Ionic & the Chapel of the Virgin is Corinthian. East & west 432 ft. the transept is 174, the hight of the North tower 230 ft. upon each tower is a telegraph and the residence of a person who tends it. In this tower are 5 Bells—4 weigh 12500 & when one was rung the whole tower was shaken. From this town we had a magnificent view of Paris & its environs. The Telegraphs are one with Italy, sth. Strasburg north. The Chapel of the Virgin is peculiar and striking. Paintings, 2 struck me as favorable, that of Louis XIII & St. Vincent praying the Sisters of Charity to establish a foundling asylum.

5. Friday. This morning visited the Hospital as usual, & saw Ricord's Patients. Then after breakfast visited the Tuileries. Passed through the Rue Rivoli—Royale and to the Church of Magdalene. This is the most magnificent building, I have seen in the old world, its situation is pleasant at the end of the Boulevards. It was begun in 1764, it suffered in its progress from various changes. In 1808 Napoleon proposed to make it a Temple of Glory, in true Roman style. It is Peripteral, has 58 magnificent *Corinthian* columns. Steps at each end. It will be completed in about 2 years. Called at Wells & Co. No news yet from America. At the Hotel de viola saw some friends who informed us that the United States had become Bankrupt.

6. Saturday. this morning saw Civiale operate in his way for stone. Breakfasted. Clark called on his way to poor Sawyer's Funeral. He has fallen a prey to his own ambition. Consumption has carried to his long home. To die in one's native land in the arms of his friends is a comfort indeed. Visited the Jardin des plantes. This is a grand establishment devoted to the Sciences. Went through the Collection of the great Cuvier, it is magnificent. There are 15 Salles or Rooms. In the first are the Cete the Balaines—the Skeleton well put up—the Cachalot. Dauphins.

2d. Human varieties. ***
3d. Boeuffs. ***
4th. Oisseaux. ***

On my way from this garden I visited the *Pantheon*. Certainly a magnificent building, designed as the Repose of the Great of France and no man is to be placed here until he has been dead 10 years. The vault is very extensive & in it are Voltaire, Jean Jacq Rousseau, the architect of the building & many who fell in the defence of their country in July 1830, the trois jours. There are two Rows of Corinthian Pillars in front, west, & its Lantern is the highest in the city. In the interior it has magnificent columns.

7. Sunday. This day I attended the Hospital and was out a short time but spent most of my time in my Room writing to my home, dear home! The day is cold and unpleasant.

8. Monday. Hotel Dieu, St. Louis. What a hoard of miserable creatures appear at the Consultation Room, the want of *cleanliness* is the cause. At one visited the Mazarine Library, mostly old Books, rich & valuable. In this Library is an immense Globe, at least 10 feet in Diameter. Fine *specimens* of ancient books. At 2 attended the Royal Academy of Sciences, this is one of the Branches of the Royal Institute of which there are 5, viz Sciences.
2 Arts. 3. 4. 5.
This branch contains 63 members, vacancies made by death. This academy is subdivided into Branches as for astronomy, mathematics, Medicine, Geography &c. Cuvier was a member. La Place &c. Dined at about 5 as usual. Read French in the evening.

9. Tuesday. La Pitié in the mng. Le Roy at 12. Obtained 3000 francs of Wells. Attended the Royal Academy of Medicine. Discussion upon the numerical system. Bouillaud & Double. Subject continued.

10. Wednesday. This day have been devoted to medicine. I am quite well in this cold country. Began upon a course of operative surgery with *Maisonneuve*[*] today.

11. Rose early. Went to the Hotel Dieu. 11 Breakfasted. 12 went to the Clarmarte. at 2 to Pitié. Dined at 6. French Lesson at ½ past 7.

12. Friday. This day have been deeply engaged in medical matters—Hospital, Lectures. Began at La Pitié upon the stethescope. I learnt this mng. that the Poland had arrived at Havre & I was delighted at the idea of some news from Home. But none!! What does it mean? Something is wrong, I am confident. My Dear Wife must have written. No news is called "good news," hope it is so in this case. One letter only & that dated only 10 days after I left home.

13. Saturday. Have been the rounds. I never worked more hard when I was a Student in Medicine. Dr. Partridge, an old fellow student of mine is here—I was glad to see him. Mr. St. John has received a letter from his Brother. More than 250 failures in New York. What a sad time! It will do good in the end. This Evening had a letter from I. Brown, Esq. which was almost hearing from home. I expect my Dear Wife is *Fatherless*. Such are the transitions of this life. We slide off.

14. Sunday. This mng. visited the Hospital then returned. breakfasted & went to Herman Thorn's to attend his church—his Preacher was sick. I then returned to my Room & spent most of the day excepting a short time in the Galery of the Luxenburg.

15. Monday—Attended St. Louis—Breakfasted on the Boulevards. At 12 went to the Clamart, at

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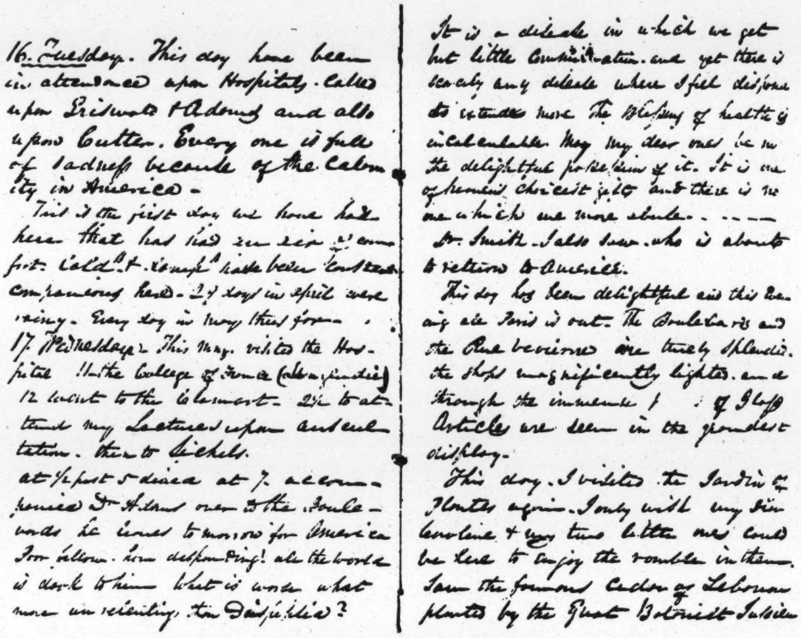
[*] Jacquer-Gilles Maisonneuve (1809–1897) of Nantes, a pupil of Dupuytren, a surgeon at the Hotêl Dieu noted for his versatility especially in surgery of the bones, intestines and gynecology.

2 La Pitié & then at 4 Returned to my Room. Saturday I heard Duménil* lecture on Medical Pathology. he is very *dull* & had only 50 *bearers*. Heard Albert also. he is a very much better lecturer. He is in his dotage. He was upon Therapeutics. He is very popular with the Students—on the 17—he commences a clinique at St. Louis.

16. Tuesday. This day have been in attendance upon Hospitals—called upon Griswold & Adams and also upon Cutter. Every one is full of sadness because of the calamity in America. This is the first day we have had here that has had an air of comfort—Cold "& damp" have been constant companions here. 29 days in April were rainy. Every day in May thus far.

17. Wednesday. This mng. visited the Hospital. 11—the College of France (Magendie) 12 went to the Clamart—2½ to attend my Lectures upon auscultation—then to Sichels. At ½ past 5 dined. at 7 accompanied Dr. Adams over to the Boulevards he leaves tomorrow for America. Poor fellow—how desponding! all the world is dark to him. What is worse—what more unrelenting than Dispepsia? It is a disease in which we get but little commiseration and yet there is scarcely any disease where I feel disposed to extend more. The Blessing of health is incalculable. May my dear ones be in the delightful possession of it. It is one of heaven's choicest gifts and there is no one which we



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Dr. Smith. I also saw. who is about
to return to America.
This day has been delightful and this even-
ing all Paris is out. The Boulevards and
the Rue Rivoli are truly splendid.
the shops magnificently lighted. and
through the immense [illegible] of Glass
Articles are seen in the grandest
display.
This day. I visited the Jardin des
Plantes again. I only wish my dear
Caroline & my two little ones could
be here to enjoy the ramble in them.
Saw the famous Cedar of Lebanon
planted by the Great Botanist Jussieu

FIG. 2. PAGE FROM THE DIARY.

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* Charles Marie Duménil (1798–1851) aspired to be a rival of Dupuytren and was bitterly persecuted by him.

more abuse—Dr. Smith I also saw—who is about to return to America. This day has been delightful and this evening all Paris is out. The Boulevards and the Rue Vivienne are truely splendid—the shops magnificently lighted and through the immense panes of Glass Articles are seen in the grandest display. This day I visited the Jardin of Plantes again—I only wish my Dear Caroline & my two little ones could be here to enjoy the ramble in them. Saw the famous Cedar of Lebanon planted by the Great Botanist Jussien, planted in 1735—It is a magnificent tree in full vigor—while the author of its celebrity long since paid the great debt of nature. Its branches at the top are horizontally spread out.

18. Thursday—Have been engaged today in medical matters. Spent an hour in the Jardin des Plantes. What a delightful place for a naturalist!

19. Friday—Have been devoted to medicine today—have seen Magendie kill another Dog.

20. Saturday. This day I have been much engaged in purchasing books for the College.

21. Sunday. Who ever saw such very unpleasant weather. Cold & rainy. Went to church today but did not succeed in finding it. then I went to the Arc of Triumph of Napoleon. it is a magnificent work. a few rods without the walls of Paris. It was begun in 1806 & completed under Louis P—152 ft. high—long 132—wide 68— in 1811 a model was placed here & Nap. & Maria Louisa entered under it in great display. A great view of the City is had from its summit. Met my old old shipmate Broxton. he had just had news from Amer. by England. Many more failures—among whom is General Jackson—good!! "Perish commerce perish credit!" What is to become of my country?

22. Monday—I have been engaged at the Hospitals during the day. This evening I have taken my French Lesson. Heard today of the arrival of another packet. I hope for Letters.

23. Tuesday. In the mng. visited La Charité! Saw Mr. Velpeau & Bouillaud—procured some Books for the College—got no letter from home. What can it all mean? Oh that I could hear from my Dearest ones upon the other side of the great Atlantic—What a cold & wet country—certainly I never saw a worse climate for invalids—Rained every day since the month came in. Called on Prof. Stanley.

24. Wednesday—This mng. did not feel quite as well as usual, took some little cold last night—rose early, attended the Hotel Dieu saw Roux & Brechet—In Brechet's ward saw a little child that reminded me of my Darling Ellen—notwithstanding the immense amount of matter to interest me here I shall be happy when I set my face homeward. Had my umbrella stolen today. Better be the loser than the thief.

25. Thursday—have visited the court part of the city today—Called upon Cutter and also upon Drs. Richards & Cromwell to make arrangements for the shipping of articles. Called upon Wells & Co. hoping I might find some letter—but none—none—On my way I purchased a pair of sabots for Kate & Ellen. May they be blessed! I think more & more of my Dear Caroline & Daughters daily—I pray they be well. The weather begins to be

a little more pleasant and the Parisians are coming out in all their gaiety—they are full of shew—This evening attended my French lesson—All are now alive about the marriage of the Duke of Orleans & Princess Ellen of Mecklenburg—*Fêtes* are in preparation.

26. Friday. This mng. rose early—attended Hospital—saw Louis & Sanson—Louis is expected to go to the Hotel Dieu. Breakfasted—went to the court side of the River—passed through the Palais Royal—saw the French full of life & gaiety. Hundreds taking their coffee under the Trees. Visited the *Royal Library*—it is magnificent, the largest in the *World*. At 2 attend my lecture upon *auscultation*. The walk was warm. Returned to my Room—dined at 6—at ¼ past 7 started for the Musard Concert in Rue Vivienne. The Hall is large—capable of containing 3000 Persons and 200 musicians. The room is brilliantly lighted—walls richly painted. The Hall is the ½ of a circle. The House was very full—90 instruments compose the concert Musard—the Composer conducts the whole—they meet *every evening*. Franc for admission. We got home at 11. The music was not to be surpassed, said St. John—If only my better half had been there to have enjoyed it—My mind rambled to days of yore when I went to the Handel & Hayden.

27. Saturday—This mng. was so much fatig'd. did not visit the Hospital—Wrote—at 12 went to Le Roy d'Etiolles's lecture—from thence to the Clamart—From there to the Gobelins—to Salpetrière & the Jardin des Plantes—The Gobelins are a Royal establishment, made so by Louis 14 in 1662 devoted to Tapestry & carpets. The *Tapestry* surpasses all conception—the masterly touches of the Pencil of a Rubens are displayed in these pieces of Tapestry—A copy of Louis Phillipe is now underway. Henry the 4—Louis the 14, Mary of Medici are exhibited with as much fullness as the best painting could have done it. A piece is many years in completing—the carpets are 12 paces wide—as I counted—The expence of these productions is so great that they are allowed to the Royal family only—

28. Sunday—This morning began a letter to my dear home—at 10 I took the Diligence for Sevres, visited the Porcelaine Manufactory. It is about 5 miles out of Paris. The day was fine and the country seemed very beautiful. Sevres is a pleasant little place—known principally for its Porcelaine. The Porcelaine like the Tapestry surpasses all ideas. Upon the porcelaine are some of the finest landscapes—representation of shells, of fruit, of birds &c. I even saw the portraits of the Kings & Queens and other personages were represented—one of Psyche & Cupid—Psyche was *true to nature*. Vases were there which were marked at 37,000 Fr. equal to 7,400 dollars—after viewing the exquisite workmanship of this place we then passed through the park—saw the grotteaux, the great cascade, all of which is a part of that magnificent palace which (Louis) 14 gave to his Brother Duke of Orleans—there Napoleon was made head of Gov't. 18 Brumaire 1799. Here was Charles X when the Rev'n. of 1830 broke out. From St. Cloud we come to Auteuil a little place where many

people resort for health. Vid. "Outre Mer"!! We passed through the Bois de Boulogne. Beautiful—was much fatigued when I reached home.

29. Monday—St. Louis—Clamart Auscultation—called upon Richards & Cromwell—upon Isaac Appleton Jewett—and returned his call.

30. Tuesday—Today wrote a letter. Went to the Clamart at 12—at 4 returned to my room, dressed and went to the Palais Royal to dine with Jewett—had an excellent time with him. It seemed like having an American Society to talk over old matters. We talked of Cincinnati—of the French dissipation in drinking—of their government—of their improvement in Railroads—of education—of their views of Domestic life—of their want of virtue &c &c—of their Religion also—A transient ship has arrived at Havre & reports worse times than ever in Amerique.

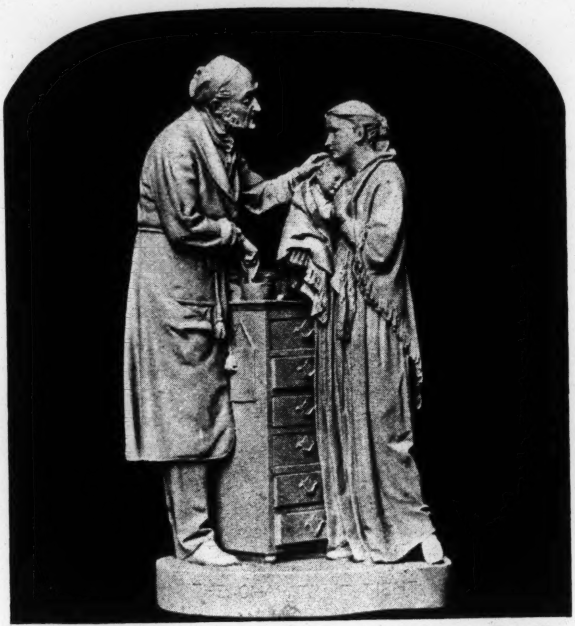

FIG. 3. A JOHN ROGERS GROUP OF POOR PATIENT AND DOCTOR (1866). ROGERS TOOK DR. WILLARD PARKER AS HIS MODEL.

31. Wednesday—The days of another spring have flown passed and mingle with the ocean of time of bygone days—and where am I? yet upon the shore of terrestrial existence while many—very many—have been called hence to that bourne from which no traveller returns—What a memorable three mos. I have crossed the mighty ocean & God has sustained me. I have wandered in strange lands—surrounded by strangers and yet I have been preserved. Thanks to that almighty power which has ever sustained me. I have turned my back to my native country & to all that my soul most highly appreciated upon earth—my Dear Wife—children—Parents—Mother & sisters. May we be

preserved & again meet on Earth. This day I have been much engaged in medicine—Books & Chemical orders. I hope now every day to get a letter from home.

June 1. Thursday. At length summer has arrived in propria persona. The weather is delightful and the rains are over. Today have been very much engaged in medical matters as usual.

June 2. Friday. Today have been engaged as usual—this evening have been at the French Theater—this is the first in France when the Ital'n. Opera is closed. I saw some capital playing & on the whole was pleased—there was a very great audience as is usual among the French—they do love the theater—Much better than the ancients loved their Household god. You could see old men & women there whose heads were snowy white. They even convert churches into theatres in France. The Reverse is true in our country. The French—that is the Parisians make one great family and live in the Restaurants & gardens—those coteries we call domestic with which we prize as the sources of our heaven borne happiness—they are, it would seem, almost utter strangers to. Their *common intercourse* is very great—hence what we call the want of virtue—but they are great lovers—great admirers of themselves—of their country & of their institutions.

3d. Saturday. Nothing special in the incidents of this day. I have been much engaged as usual. Have not yet heard from America—Bespoke some instruments at Samson's for the Eye——

4. Sunday. The morning at the Hospital—went to the Tuileries—saw the entrance of the Duke of Orleans & the Duchess—Louis Philippe and the rest of the Royal Family with the King and Queen of Belgium—The concourse of people and soldiers was very great but did not compare with that of Maria Louise in 1812—I cannot say that I entertain the shadow of envy toward him. I prefer my condition—humble as it is and believe it replete with as much or more happiness. "No one would change his neighbor with himself." How greedy are these French to see everything in the shape of novelty—Ceased to dine at Mad. Mechen's.

5. Monday—I rose at six—made my toilette and started for Charenton. It is about 2 leagues from Paris. The walk was very pleasant—up the Seine. Charenton is a village that in the time of Henry 4, Louis 13 & 14 was celebrated for its religious controversies. Now for its large Insane Establishment at the head of which is the old & distinguished Esquirol.[*] The Hospital is in magnificent order and in an admirable situation—contains 500 inmates. This place is designed for the reception of hopeful cases only. The treatment is *moral* & a steady unrestrained occupation—On my return I passed over to Alfort to visit the veterinary school—where are some 200 or 300 pupils. The establishment is spacious—permanent and in a most perfect state of preservation. Vicq-d'Azyr,[†] Daubenton, Fourcroz

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[*] Felix Vicq d'Azyr (1748–94) was permanent secretary of the Paris Academy of Medicine and one of the greatest comparative anatomists of the 18th century.

[†] Jean Étienne-Dominique Esquirol (1772–1840), noted for his studies in insanity and author of Des maladies mentales (2 vols. and atlas, Paris, 1838). He succeeded Pinel at the Salpêtrière in 1810, carried out the

have been Professors in this establishment. For a fuller description Vid. Galignani. Returned to the city to my other duties—dined at the Restaurant Val de Grace. This place we have visited—saw the chapel made by Anne of Austria, mother of Louis 14.

June 6. This mng. I spent at the Clamart. As I was returning I was informed by one of my compatriots that my Banker Wells had failed—if so, thought I, what is to become of me! I went at once to the other side of the River but could learn no such report. Visited the Bibliothèque du Roi—the greatest library in the world—is open to all 2 days in a week & to readers oftener. Called on Dan'l. Cutter and dined with him. He is a very obliging man. Bot gloves for myself.

June 7. Wednesday—have been in medicine today very constantly. At 5 P.M. went to my Dinner and then to the Theatre Francais and the play was Julia—magnificent play. Md. Plessy surpasses anything I ever saw in working upon the feelings. I did not suppose I was coming to Paris to cry of Fiction. I have feelings that are very readily moved. I never saw such strong effection displayed on the part of the daughter Elise. It made me think of home—& the tears, sweet tears—they poured forth without a biding.

8. Thursday—This day devoted to matters of the Profession. Nothing of interest came up. I have attended at the Clamart and the Hospital—Dined upon the other side of the River at Colbert's. Spent the evening at home, had a call from young Barclay who is to accompany me to Italy.

9. Vendredi—I have heard again that my Banker has failed. If so, what is to be done? In a Foreign land and no funds. I learn the arrival of the Louis Philippe, no letters have come. The Poland which sailed on the first was obliged to put back from running upon a Rock. This evening attending at the French Opera. Certainly it is a magnificent establishment. The scenery surpassed any thing I could have conceived of. All singing and acting, no speaking. Madame Ellerly performed—the most accomplished player now in the city—Singer & Dancer.

10. Samedi—This morning I was in much trepidation from learning last evening the Wells & Co. has stopped payments. If so I was "done up." Early I called upon him & found all well. The Bank of France has aided him & his. After closing with my Banker I visited the Madelaine. Certainly the most splendid building I have seen in France. It was ordained in 1763 Louis XV. It lingered till 1808 when Napoleon conceived the plan of making a Temple of Glory. It is wholy of stone—after the best modeled of the Roman Temples. Has a Peristyle of magnificent Corinthian Pillars 52–60 ft. high. In its Pediment is a magnificent Alto-Relievo—Sth. North—the Bells 4—Its interior now finishing are 3 mag. Domes for light—300 ft. Long—130 wide—60 high. Marble & *Gilt* very good—the marble like the Puddingstone—the Eye rests upon the building

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latter's "open door" ideas concerning the treatment of the insane, reformed their housing and care not only in Paris, but all over France. He founded ten asylums in various parts of the country and was the first to lecture on psychiatry (1817).

in all its Proportions with great pleasure.

From this place we went to the Diorama. 1st. We saw the dedication of Solomon's Temple. 2d—the Valley Goldau of Switzerland. 3rd. Mass at midnight in the Church of St. Stephen—the light was good & the scene beyond conception. Solomon's Temple, you see the stars. You see the Bridges lighted up in the distance. It gradually becomes light & you see myriads of people worshiping in the court. You hear the Organ. You see the great temple lighted up. Gradually it darkens—then becomes somewhat light & all are gone. 2d. La Vallée de Goldau-Suisse. You see this beautiful vallée by day. The Lac de Zoug. La Montaigne at the Right & that of Right 5676 high. Night gradually approaches, the scene is hidden in Darkness. You see the Lightning afar—the Moon light breaks in & you see the Eboulments or avalanche which happened in 1806—2d. of Sept. and overwhelmed & buried that little village. You see crowd of people with hands uplifted & imploring. The scene changes & the vale returns. 3 church of St. Stephen & mass at midnight. I have seen nothing in Paris that surpasses this exhibition.

11. Sunday—Rose early—took my breakfast & rode to St. Cloud—saw the beautiful Park between this place & Sevres—the Palace or Royal Chateau where Bounaparte was placed at the head of France the 10.N—1799. The Revolution was affected without the loss of blood. It was always a favorite spot with Napoleon. Louis 14 procured this & gave it to his Brother, the Duc d'Orleans. Louis 16 afterwards purchased it and gave it to Maria Antoinette. It is now national property made so in '93 Revolution. Its interior is garnished by good paintings & statuary. Its Parc, Las jets d'eau, an *immense Cascade*—a Lake & an orangery—the King & Queen sleep together here!! From thence we went to Versailles—the walk from St. Cloud about 6 miles was very pleasant. Versailles was a place of over 100,000—but now contains about 30,000. The place was first brought into note by Louis 13 who built a hunting house there. Louis 14 conceived the idea of the Palace in 1664 & completed it in 1702. It is probably the most magnificent Palace or Chateau in Europe. It cost 50 millions sterling—It fronts the East & West—the West looks into the garden which in magnificence surpasses all my ideas of grandeur. Jets d'eau are numerous—the groves, the promenades, the canal, the sculpture, the orangerie, the hot house, the *lime trees*, the Box, the manner in which all are trimmed, the Bassins of *Neptune* at the north, of Latona, of the God of day and of Winter are the most splendid, the Galery of paintings, the statuary, the Chapel, the Gilt work inside are great in the eye of an humble American. The Chapel is beautiful. The Galery is made up mostly of historical paintings—those especially pertaining to Louis 14, and to Napoleon—as you pass through Galery you will find the Rooms numbered as they mark a *particular year*—the great Battle of Waterloo—and St. Helena are not there—in the 3d. Story are Portraits in great abundance of distinguished Personages of all pursuits—Many of the nobility. The Palace of Versailes surpasses

anything & everything of the kind in Europe. Saw the Royal Family—the crowd following them—who can be more dependent than these personages—doomed to an eternal fame in a moment by the fickle feeling of an ignobile vulgus—Reached Paris at 8 and glad to get back—What must the *Protestant, Pious* Dutchesse think of this parade on Sundays?

12. Monday—This mng. visited the Hospital La Charité—at 12 visited the old Church of St. Stephen (St. Etienne du Mont)—some part of it was built in the 12 centy. It is not large but a fine specimen of gothic architecture & has some fine Paintings & the Glass stained like that at Rouen. From here went again to the Jardin des Plantes—this is a place I love—it is full of science & learning—Heard Prof. Valencia give a lecture upon the Molusques—the Garden is great. 2 large hot-houses. 1. Musée of Comparative Anatomy has 15 rooms. 2. Chemical Laboratory. 3. Musée Botanique. 4th Musée de l'histoire naturelle—this Building is large. 3 stories. On the Lower are the skins of the Elephant, the Rhinoceros, the Hippopotamus, of Serpents, and Shells—fossils and splendid specimens of corals & coralines. 2d. Etage contains the specimens of Pisces, Reptiles &c. &c. 3 Etage—Specimens of the Aves. the best in the world—these are upon each side—at the west end are the Simia—vespitels Feline—Canine families, the Marsupia—squirrels—rats &c & the East are the Deers, sheep. Camels—Dromedary—Cameleopards male & female 18 ft. high. Buffalo—Cectacea &c. In the center of this long hall are arranged the specimens in Choncology. Entomology—I saw one Carina (shell) which is the best known & is worth a 1000 Dolls. 5—In this Garden is a splendid building now nearly done wh. is for minerals & specimens in Geology—the Building is long—

13. Tuesday—Have been very much engaged in getting ready to leave Paris. this mng. heard Lisfranc lecture—procured instruments of Sanson. Attended the theatre Francaise and saw Mdm. Mars—the old Maitresse de Napoleon—she is the Theatrical Star. I did not think much of her—she was in the Misanthrope of Molière. The theatre was very much crowded.

14. Wednesday—Today has been the Fête Extraordinaire for the Duc d'Orleans. I have been out but little today. This evening I was at the Champs de Mars—Where the feu d'artifice was more magnificent than I ever before conceived of—about 200,000 Dolls. have been expended upon the exhibition. There was a large fort built with its parapeted towers. It has been building for several weeks. The cannonading was grand—the rockets and the conflagation was magnific. The French have enjoyed this day—it has been Elysian to them—the Lust of the eye is *indomitable &* it would seem that all Paris was out at the exhibition—Bot Books & specimens today for the College. Retired at 12—I rejoice that the parade of the new married couple is about over.

15. Jeudi—Today have been very active in getting ready for Italy—In the mng. called upon our chargé des affairs—got his Sigtre. on the Passports. 2d. we visited one of the Abatoires of this City. There are 4 of these establish-

ments which belong to the city. They are magnificent slaughter houses—we went through the Abat. de Mont Martre—It is 389 yards long—140 broad—Altho the day has been excessively hot the whole establishment was perfectly sweet—100 oxen 3 or 400 Calves—1000 or more sheep killed every week. There are compartments where the animals are kept. Fountains are so arranged that water passed through & washes at pleasure—We may take a good lesson here. Next we visited Mont. Martre. Here is the 2d great necropolis of Paris. In splendor it stands next to Père Lachaise—yet is far inferior—the natural beauties surpass Père Lachaise—some fine monuments of taste & splendor. The principal is that of the Dutchesse of Montmorency & a smaller one of Prince Ernest of Saxe Coburg who died at Paris in 1832—This was once a Gypsum quarry, well known to every geogogist—is where the great Cuvier figured & made his splendid observations—first called the champs de repos. Now Mont. Martre—from Mons Mars—a name which the old Romans gave it from a Temple there to that God—Leaving the cemetery we mounted the higher part of the Hill—where we saw the place. Paris the country North & West—beautiful—beautiful. On this summit are 6 wind mills for granding Plaster. We visited a fine little church in this place—saw in it ordinary garniture. Paintings, crucifixes &c. by it are the relics of an old convent of the Benedictine Nuns. Upon the Tower of it is still a Telegraph which held communication with Bordeaux, Brest & Spain—from this place is seen Mont Calvaire—the highest elevation about Paris. N.W. from the city—2 Leagues—upon it are 3 Crosses. As we descended & even while in the cemetery the city began to pour forth its dead. We met droves of the undertakers with their black cocked hats—horses & carriages—seeming to shew forth in all the habilments of death. Some with much & some with little display. One of the carriages was bearing onward to the long hame the dead—the coffin was covered with a *white pall* & passing from the sides of the coffin were 4 white Ribbons—which were trailing each a young Miss or Lady dressed in *white* & over the head of each was a large white veil—no bonnet—after these were 75 or 100 following in the same attire. They do not, as with us, walk 2 & 2. Females. I have never seen before going to the grave. This was a Virgin!! Yes, so said in Paris—After this we met a member of the Legion of honneur, his trappings were born after him. The French seem to give but very very little of that manifestation of feeling which is so common among us. Why is it so—is it the religion or because they have less affection? All seems to be done when the dead is hid and a Chaplet of life Everlasting is placed over the grave—

The dead of Paris are a source of great revenue—the whole business is let out to contractors & such, a percentage is paid to government, 67 percent, the dead rest but 5 years & then are dug up to make room for others—and in Paris about 30,000 die annually. From thence I went to my Banker & settled up—then visited several old churches—St. Roch—the church of Ascension

&c—Saw the Garden de Tivoli—a pretty resort for a warm day—

16. Friday—Today have been very busy in procuring Books &c—have been to see no sights—Wednesday night in coming out of the Champs de Mars many people were killed in the crowd—30 or 40 have died & many more will not recover. Heard today of the death of King William IV—visited the Musée d'Artierie, certainly a splendid sight—the steel armour.

17. This day have been making all possible speed to go from Paris—am fatigued and shall be very glad when I get through.

18. Today I early discovered that I had lost 4 Doubloons, equal to 60 Dolls. no small loss at this time. My trunk must have been open'd & the money taken. I also found my keys wh. I lost six weeks ago—I am confident that John is the rogue and the money could be obtained had I time to remain here.

Visited the Catacombs today—saw but little of them—people are prohibited entering. My Sundays in Paris I have spent in part in visiting the Repose of the Dead. These catacombs I should like to have seen but the public are now prohibited from the great danger in entering them. We returned from the Rue d'enfer by making a delightful promenade through the Luxemburg Garden. We went to our dinner & then I came home & early retired.

19. Monday—this morning paid up my Bills for Books—got my boxes &c ready for transportation of which there are 4 for the college & one for me & a trunk. *Wrote two letters*, one to my Dear home & one to Rogers of Cincinnati—Visited the Musée de Dupuytren. It is one of morbid specimens & must be the most magnificent in the world.

1—Fractures of the head & all bones.

2—Spontanious lesions—As exostoses—hypertrophies of the bones of the head—malacosity of all the bones of the body—of the curvature of the spine in particular. *Spina ventosa*—3 magnif. specimens, two of the leg—one tib., one Fibula, one of the forearm.

3—Hydropic heads.

4—3 Fistulae of the stomach.

5—Abscess of the liver—Tubercular *degeneration* of the Peritoneum, etc.

6—Carcinomita—& encephaloids.

7—Herniae of all kinds.

8—Calculi of all kinds.

9—Hearts diseased—Aneurisms—cancer of a lung—Right.

10—Disease of the large vessels.

11—Hermaphrodites—Excressences upon the Genitals—Uterus double—Ruptured.

12—Extroversion of the Bladder & uterus.

13—Monstrosities.

14—Wax preparation in the center of the Room.

Called on Velpeau. At six P.M. we left Paris & I must say I felt somewhat sad at the idea of leaving *forever* this great city—there is much to delight in it—much of science to induce labor—and give great pleasure and satisfaction to a scientific as well as a frivolous mind. The French are gay, thoughtless, irreligious, and consequently without that firm and constant integrity that belongs to the dear land of the Pilgrims. Still I like Paris—there is in it no religion—especially among the men. Among the many I have seen confessing in their churches never have I seen other than women bending to the ear of the ——— Priest—We had a pleasant ride on the night of the 19—we passed through Alfort & Fontainebleau but saw little of it. In this place is a grand Royal Chateau. Here Napoleon held in confinement the Cardinal. Here he abdicated his throne for Elba in 1812 [sic] 1814. Here the Duc d'Orleans was married to Helen, the Dutchesse of Mecklinburg, Mai 29, 1837. The ride out from Paris along the Seine was delightful—delightful.

20. Tuesday—The morning is magnificent and the country far surpasses my most sanguine espectations—the Road is straight & paved. No *fences* in view & the country open, free from wood & hills—many of the Lombardy Poplar, but *thrifty*. Not like ours —the *vineyards*—these are on every side and splendid. The vine is allowed to grow about 3 ft. tied to a stake. The vineyard at a distance resembles our cornfields. It strikes an American very odd to see women at work with the men & as the men reaping, hoeing, driving teams, riding the Jackass of which you see very many. Women know nothing of work in America. Men here are idle, lazy, the women raise the vegetables. Carry them to market. Keep the purse and books. The people live in this country in villages not scattered as in ours—the women do not move. The reason why they live in villages is for mutual protection I presume. The women's dress is a chemise—a peticoat with shoulder straps and shoes & stockings—you seldom see a female in this part of France without these articles of apparel. The head is covered with a cap—a Handerchief or a large straw hat—generally they are very much *burnt & tanned*. In this Department of Yonne we passed through several Villes as Sens, Joigny, Auxerre. All these places have a wall. Some old buildings of interest. At Auxerre we dined—& then went on following the beautiful Yonne a short distance from there—then leaving it we made a short stop at *Avallon*, a beautiful village with a fine walk of lime trees—dressed by the pruner's knife as is customary in this country. From this place we passed across the country to Châlons upon the Saône, wh. we reached Wednesday about 1½ P.M. This route was very hilly, seming more like some parts of America. Small villages. No scattered buildings. Vinyards. Rye & wheat. People the same. Beggers very much more numerous, besetting ye whenever the Diligence stopped —their hats or hands out with a doleful tone of voice—homme pauvre, misérable, infortune, donnez un sous, s'il vous plait pour la charité—they are very annoying.

21. Wednesday—Châlons is a pretty walled city of 13000 inh. on the west bank of the Saône. Here is a large hospital of St. Laurent—good yards attached to it—a promenade east of it—these being upon the east bank of the river—a good bridge, theatre—several *old churches*. The canal terminates here which connects the Loire & the Saône. Good hotel. *Trois Faisans*—we were glad when we reached this place to rest & clean up.

22d. Thursday. At 7 we embarked on board the Hirondelle, a *pretty little steam boat* for Lyons, a distance of about 35 Leagues, this day's ride was delightful. The Saône is a beautiful little stream & its *rich banks* are a constant source of interest.

Macon in the Department of Saône & Loire is the largest & handsomest place upon the river —on the west side has a good Quai from which the Alps may be seen. As we approach Lyons the Banks are more wild—the scenery more bold & picturesque—and there is a bridge also wh. is attributed to Caesar—about Lyons, it is hardly surpassed by that of any country or place. All the places upon the Saône were known in the time of Caesar. The Adui were the early inhabitants. We arrived at Lyons at 5 P.M. after a very pleasant excursion. and put ourselves for safe keeping at the Hotel du Nord where we found a good Land Lady & things very comfortable—this is the 2d. city in the Kingdom in point of wealth & population 200,000 inh. situated between the junction of the Saône & Rhone. In this city there is much of interest Ancient & modern—is in the departnt. du Rhone. It was founded by a Roman Consul Lucius Munacius Plaucius—the friend of Cicero & Horace—under Caesar it received the inhabitants of Vienna—chased by the Allobroges. Upon the Hill or côte was the Edifice built by Trajan. Place now occupied by a petite Eglise—was called water Forum in the old writers. Objects of attention. 1st ascend the elevations & view of country & ville—it is magnif. the west side is the preferable elevation for view. The east of the Saône for antiquity.

There is the Square of Louis XIV Bellecour and his statue—the building about this good, high, everything is made of stone in this country. The Hotel de ville is a splendid piece of architecture—Henry IV—in front, within are 2 allegorical figures of the Rhone & Saône which were once in Bellecour at the foot of Louis 14—the large Theatre near the Hotel de Ville is a fine building—there are 4 Theats. in the city.

The Musée is well worth seeing—the Gallery of Paintings are very good, the works of the old artists —Salle of Statuary where are in marble & plaster Apollo Belvedeer—Venus de Med—Pandora —Castor & Pollux—Pallas—Mercury—Euridice bitten by the serpent—the boy with a thorn in his foot—Antignous & many others—Specimens of Mosaic are very good—Many young artists we saw in the Gallery Cabinet of natural History—A large collection of antiquities procured from the old town of this city.

Churches.

Le Cathed. de St. Jean was the one wh. I visited. It is the work of many ages. Very old Gothic good—we went into the tower or rather into one of them—for are 3—we saw the great Bell—in this Tower are 7—one about 200 years old weighs 20,000 or 10 tons—has some good paintings. In the *upper part* of the church we found an old Lady weaving silk. *Un Sous*. The church is very large and equal to any of the old Eglises in Paris.

Hospitals. Hotel Dieu, founded by Childebert & Uttrogothe, the former son of Clovis. It is now one of the largest in Europe. 1000 beds—3 surgeons—6 Physicn. 18 interns. Wards are very large in the Salle quatre rouge are 200 beds, in 4 others—each has 120—

the Salle Quatre rouge has a magnif. altar. Here is a Salle for accouchement, Convalescents' Salle also—wh. is a good plan—patients after operation are put into a ward by themselves. We are carried all over the Establishment by M. *Vitelle.* The Tower is 300 ft. there is a church or chapel—150 nuns take care of the Hospital, Patients &c.

Surgeon in Chef. Bagards
Bonnet aid-Major
Calvat " "

Medecins Brachet—Chapeau Montfacon—Rougier—Pointe & Gubin. Bagards performs most of the operations. Employs the single Lithatome only—had three operations the day I left the city—Abaises the cataract altogether. Connected with the Hotel dieu is a room for dissecting—Lecture Room—L'Ecole secondaire—Brachet visits his Patients in a large Robe black. Hospital de la Charité—this Hospital grew out of a famine in 1531. Hospital des Insensés—this last is upon the hill where is a venereal ward also, called also antiquaille. One was the Palace of the Governors of the Gauls—Claudius & Caligula were born there. There also Antonia gave birth to Germanicus.

24. June—Saturday—Left Lyons at 4 A.M. steam boat for Arignon—The mng. delightful—in the middle of the day very hot and at 4 P.M. a smart thunder shower. The boat was filled with passengers. All French except one who claimed to be a Mustleman from Algiers—was so in dress but in speech a good Frenchman—On our way down the river on the East bank is *Vienne,* a fine city in the time of Nero—the rival of Lyons—belonged to the Alibroges—here are several remains of antiquity—as cathedral' Triumphal arches—Amphitheatre—*Pontius* Pilate before whom our blessed Saviour was arraigned—after he was banished from Judea—he came here and in this city he died by his own hand. Tain, a small village we passed upon the Rhône is famous for the Red & White wine called the Hermitage. Valence—Tournon—Orange are all places of interest upon the River—Valence (where) Pope Pius VI died 1775 was among the Romans Valencia. On the East bank some little distance from the River is seen the old ville of Orange in which is a fine old edifice called the Arc de Marius—it stands near the road & makes a kind of Tower upon 3 arches 160 ft. high. This monument is distinctly seen from the River. The River is rapid-constantly changing its bed—muddy—full of islands. Many bridges cross it one at Valence built in the time of the Romans. The longest over the Rhône is the Pont St. Esprit—this Pont is much celebrated for its beauty & permanency—it was built by an order of Monks—from 1265 to 1309. 3000 feet long—has 19 arches—& several small ones. 9—think. The Banks of the Rhône are very different from those of the Seine, the Saône or any river I have seen in France. They are wild and picturesque. Much of the way we are saluted by barren cliffs with immense ravines, abounding in vines & made the site of some ancient villa. The summits of many of these cliffs bear upon their summit the remains of some old castle, the sad relic of former grandeur or of a Power trembling for its own wickedness. The Alps are seen much of the sail in the distance.

The Boats here are very small compared with those of America. Some of them made of iron.

At 6 P.M. we reached Avignon, so famous in History. This city is one of the best *walled* cities in Europe—it contains 30,000 inh. we placed our selves in the Hotel d'Europe—which is one of the best I have seen. The Gascons are always beseeching you to remember them. We dined & went to bed much fatigued.

25th. Sunday—At 7 we took a cup of coffee—hired a cabriolet and went to Vaucluse—the most romantic spot I have ever seen and rendered notorious not only by its own native grandeur but by the immortal lays of Petrarch. It was here he lived and devoted himself to the muses in 1335 & so on. It was here that he poured out the unadulterated affections of his soul to the Belle Laura. It is about 16 miles from Avignon through a splendid country of vinyards, olive trees and mulberry groves which have at this season been mostly stripped of their leaves.

Vaucluse Fountain is at a niche in the mountain. This mountain is of stone alone—jutting over & 720 ft. high. The fountain is clear, unfathomable, is the source of a fine clear large stream, filled with trout—and empties itself into the Rhone. As you pass to the main fountain you see thousands of pure fountains gushing forth from under your feet & pouring into the River Vaucluse. We asended the mountain from whence the prospect is enchanting, the valleys flowing with "wine and oil," the meandering streams, the Alps on the N.E. Ventoux, and at the South you see the Mediterranean. There is a House here said to have been the Residence of Petrarque—before him a residence of the Pope—perched upon a precipice 408 ft. above the vale below—this we examined; it is a place wh. every traveller ought to see. We returned in the evening very much fatigued. While at Vaucluse I entered the Church; it was full of women—one man alone in the congregation. Strange! Heaven must be composed of women if the Catholic Religion be true. All this country is "*set out*" with crucifixes indicating its religion. In one place we passed today there was a large one, Christ upon it, the size of life & flesh color—At Vaucluse is a Pillar erected to the memory of Petrarque 60 ft. high.

26. Monday—I have said that this was the best walled city I had seen in Europe, the wall is 50 or 60 feet high, parapeted and a fosse in which is running water, or Moat. This high and impregnable wall enclosed the Palace of the Popes—the city is very antique—streets narrow, winding. On the west side you mount upon a terrace that must be 150 or 200 ft. above the Rhone wh. affords a fine view of the country, especially the beautiful village of *Villaneuve*. Just above this you [see] Rauquemaure where *Annabal* crossed the Rhone to enter Italy—from this wall departs the Bridge which crossed the Rhone upon which near its center is a small chapel—the arches of this old bridge are magnificent. It was designed for the passage of foot passengers and Asses of which you see very many. We first visited the Cathedral—it is in fine order—situated upon this kind of *Acropolis*. In front is a large crucifix with the Apostles & Mary about it—the

whole a bold piece of *statuary*—about this the Catholics kneel—the church itself is the work of many ages. The vestibulum or porch is charming—it was the work of the Romans. A Temple of Hercules 2210 years old. The center of the church & the Dome of the same age. There is a *chapel* here on the sth. side built by Constantine, the first Roman Emperor who embraced Christianity in 330. In this Cathedral are the mausoleum of Pope Jean 22 and of Benedictus, 1334.

Many of the Chapels were very gaudy—one in which was the Madona & the Infant Jesus—dressed with white robes & crowns—They have here also Christ in the Tomb, large as life—the crown of thorns still upon his head. I was singularly impressed with this sight—but the ancient architecture of the building is most to be admired. From this went to the Palace of the Popes, now a *soldier's barrack* and a Prison—I cannot describe my feelings in entering within these mighty walls—where the darkest human nature is capable of had been perpetrated—the halls of torture for freedom of thought. The Palace is a hollow square—entrance on the west side. East the Inquisition—South the Chapel—& Norths Halls of reception &c—& the Angles are immense towers—the apartments of the Inquisition were 1—the chapel 2d. the court—3d the place of Torture. A walled place conical form—open at the top—where the heritic was tortured & burnt. The walls are black. We then descended, entered a gate and passed toward the North East corner. Opened a heavy door and went down into a Room under ground somewhat—here we came to the *Tribunal*. By the side of this was the cell of severest Torture—the vaults of these rooms fixed to deaden the cries of the sufferer. In this the walls were black—calcined—the Oven is still there—Horid!!

We then went further on & saw the old Prison of the Pope—saw the Room where Rienzi was confined—we saw also the opening which the Pope made his escape through & there passed by a subterranean passage to the strong *castle* at Villeneuve. Saw the place where the Glacier Masacre was in 1793—200 were butched & hurled down 60 ft. through an opening—it was upon the side of the building so constructed as to enable the defence by hot water. After this we visited the Musee and saw two or three old churches, not however of much interest. Dans l'église Miséricorde is an Ivory Crucifix 26 inches long & the work of the 16 siècle. The Tomb of "Laure belle" was at the Church Cordeliers but was destroyed in the time of the Revn. The whole city has very much of an antique air in and around it. At 1 P.M. we took our places in the Diligence for Nimes—distant about 6 leagues—the ride was very warm and dusty—yet every thing to delight on the way, the vinyards, the olive groves, the finest I have seen. The fields already ripe for the Harvest, and full of men, women & children. The women work *as the men:* Reap, use the sickle, the scythe, the plough, the fork, all very different from ours in America. The working women (and all work here while the men do nothing) wear 1—cap then an immense Black *hat*—with a crown the size of a common Tea saucer

—this is peculiar to the south of F. No fences in this country. Work done mostly by Asses & mules. *Vines* not *staked* as in the middle & north of France. We passed the River du Gard—over which is the famous aqueduct of the old Romans, called Pont du Gard. We reached Nimes at 7 P.M. & put up at the Hotel de Luxembourg. Dined here at about 7½, after dinner made a petite Promenade—there is no place in all France more famous for its antiquities than this.

27. Tuesday—Nimes as we learn today contains 43000 inhabts.—is very ancient. By some it is said to have been founded by Nemansus—a descendant of Hercules—others derive its name from Nemus a grove &c. any how it was known before the Christian Era—perhaps the same age with Marseilles. The Valci were its first inhabitants and we find them opposed to Annabal 218 before Christ. It became a Roman Province under Cezar & Augustus did very much to enhance its glory. There is now to be seen here of Roman work an Amphitheatre in a better state of preservation than any other—the Palace or Forum of Augustus—The Baths of the same—Temple of Diana—and a Tower called here Tour magne—several churches and 2 or 3 Protestant churches. I was informed by a Swiss gentleman, inteligent and engaged somehow in the Protestant cause, that there were now 15000 in the city & increasing; before the time of Napoleon. They were not tolerated but driven out from the city. Now all are tolerated. There are also in the neighborhood Bohemians who live in glens and caves. Several of them are to be found under the Pont du Gard within its arches. Nimes in 408 was invaded by the Vandals—in the 8 century it was taken by the Saracens—burnt and injured in every possible way by Charles Martel. Under Pepin it was added to the crown of France.

The amphitheater has served for its original purpose for barracks, for a castle, for a residence; in form it is Oval. 409 long Diam. 317 short—63 ft. high—Capable of holding 23000 spectators. The attic is distinct, the *Podium* was also distinct—on one side was the nobility—on the other the vestals. The Beasts were admitted under these—the Gladiators at the Ends of the long Axis. Naumachia were performed here—Water by the Pont du Gard—What a passion the ancient Romans had!! The Maison Carrée is the center of the Augustian Forum & in it is a fine Musée of antiquities & Paintings—Cromwell raising the coffin lid of Charles 2d. Pont du Gard—Persecution of the Bohemians in the worship of the Druids—The Baths &c & Temple of Diana—the stones not cemented.

28. Wednesday—Last evening at 10 we mounted the Diligence for Montpelier—about 18 miles—very warm—dusty uncomfortable. Nothing gained without labor and we often travel thinking to make it past-time. What a laborious one it is. Entered the famous Mons Puellorum at 5 AM—sleepy & fatigued. We found a good Hotel at the Midi. Cleaned and prepared for Breakfast. I however went out at once to visit the Hospitals & see the medical stars. This city has 2 large ones—one called the *General*, the other the *Militaire*.

I did not remain long at the General, but went to the Militaire to see the wards of Lallemande. He has a large service in this H. Serre is his surgical collegue—who was there with Delpech—Heard him give his clinique. was very dull. Saw a new nose made by him—a Patient in which he had laid bare the muscles of the neck in removing a Tumor. Breakfasted then put out to see the City—old as the 11 centy—Situated high, has a commanding prospect of the country abounding in vines and Oliviers and wheat—here for the first time I saw the Mediterranean.

Streets very narrow—buildings high & irregular. People live in the streets—work hard. Citadel at the east part of this city & makes a part of its wall—fine walk here. Place de Peyron very fine—have seen no better in Europe, made by Louis XIII—Famous Aqueduct made by him. Triumphal Arch of Louis the great. Cathedral & Bourse not much. Medical School—of more interest. It was formed in the 12 cent'y—it is not certain by whome—Avicenna & Averhoes came here and taught. The Medical School is a part of a University, Chaussier, Dumas, Chaptal & a host of other worthies here. Building has a large Theatre—Sella Curialis of Marble from Nimes in it. Chemical Laboratory—Library of 30,000 vols. A good Anatomical Musee—Large Tumor 63 lbs. Elephantiasis removed by Delpech—Wax preparations very good—of the eye, ear, matrix, monsters, one put upon the side. Salle below was handsome with Fresco & the heads of the men distinguished in the various departments of the Profession—Salle of Portraits & Room of meetings. Salle for Examinations, in this was a bronze bust of Hippocrates—very old—given by Napoleon. At nine this evening we took our places in the D. for Nimes where we arrived at 4 in mng.

29. Thursday. Hired a private carriage for Arles—we saw but little of this place, is on the Rhone—very antique, has an obelisque—amphitheatre—aqueduct of the Romans—several old churches—Here we took the boat upon the Arles Canal. This is a good canal. Banks very perfect, water clear. Bridges very good. Country some of the way pleasant, rich, passed an old Roman Aqueduct. The canal terminates in an arm of the Meditern. Here we took a sail boat and went to Martigues, a little town of 8,000—all fish mongers—few men we saw—Oceans of women. *Caps short Robes*—blue stockings & working out doors—carrying immense weights upon the head—Wedding & danse at the house where we put up but we were not disturbed as we had not slept for two nights.

30. Friday. At 4 in the mng. took the Diligence for Marseilles—the country is hilly—good roads. Hot—Hot place!! in entering Mar. our luggage all overhauled—good City, Mercantile—has the aspect of New York, 150,000 inhabitants—is the first place for shipping in France, good harbor well fortified—we ascended the height, had a fine view—some fountains in the place. Streets wide—well paved & side walks—Saw Henricus—Croxhall, the American Consul—got our passports arranged—engaged our places for Civita Vechia on board the Sully. Hotel was Des Am-

bassadeurs—good—purchased a Sac de Nuit, wrote to my Dear Wife & Children. In this city the Colera prevailed sadly in 1835. There are several Hospitals here. The Drs. distinguished are Cuvier & Martin. The Fish *Market*— what a place—The Women keep it—fight there—children. Yachts here very pleasant—awnings—pleasure boats—Language broken—and different from the Parisien.

July 1. Saturday. At 11 we took our places on board the steam boat. Had a delightful sail. We had an opportunity to view the harbor as we departed. The whole coast seems rockbound and inaccessable. Toulon and Nice we passed at a distance, the former the place of the great arsenal & where Napoleon began his labors the other for the *Nicean Creed.* I thought of home in being at Sea. We were in sight of the shore all the way bold & picturesque—made so by the spurs of the Alps. The Evaporation of the Mediterranean sea very great. The sail was delightful. My thoughts & reflections!! These are the waters of the Romans—Greeks—Carthaginians—Syrians—where they made their first and feeble attempts in navigation—upon these waters a Columbus plied. Have a capuchin on board—how odd.

2d. Sunday. About 12 came in sight of Genoa—splendid sight—splendid harbor—buildings appear well—entered the Harbor—2 Arms or moles, light houses—shipping small compared with what it once was. Boarded by health officers, Custom House officers. Is this charming Italy before me? Landed by Boat & went to the Hotel de Londres, good one, visit by waiters, jobbers, beggers, My God—how tenacious. You can neither kick, drive, look them off, but money they must have. After arranging ourselves in our rooms & taking our dinner we sallied forth into the city. The Buildings very high—streets well paved—Cleaner than those in the south of France but very narrow—from 3 to 20 ft. wide but few of them wide enough for carriages. The people seemed neat, good looking, the females—dark eyes—brunettes—and a strip of muslin over the heads, made our way to a church, it was large—splendidly adorned & full of men & women in the attitude of worship—the Nave and parts full—the first time I had seen men engaged in this *holy act*. In France the women do up all the worship and if by the Roman Catholic religion Heaven is to be gained—the inference is that it will be composed of females & Priests—the chants & the deep tones of the organ were impressive—and the women in their white veils made a grand appearance. The chiesa was that of St. Ciro (Siro), built in 250, the old Cathedral. The Cross, the virgin, the child Jesus are the objects of worship, especially the former. The cross is carried, is kissed, is the Palladium of their salvation. After the raising of the *host*, the congregation dispersed—we examined the rich marble pavement, the beautiful coloring, the decorated chapels, the sculpture of Puget, the picture of the assumption & the adoration of the shepherds. We then ascended to the Public esplanade—which is handsome, yet inferior to those of Paris. Fountain in the Center. Band of Italian music playing here & an immense concourse of People were gathered to regale the *Ear* with music. The Italians love music!! Bells chime here at mng. & evening. Wall surrounds the whole town, 30 or 40 ft. high & a parapet walk upon its summit. The first of these walks called aquasole—2d. Promenade des Remparts—Theatres are 3—that of St. Ch' Felice the most splendid marble front. Pillars are grand, interior, the Parterre large and commodious, six rows of Galleries. This theatre we attended. In going to our lodgings we got lost but at length found a French man who conducted us to the Hotel—this ended this day.

3d. Monday—Rose early—took a valet de place & visited the Cathedral, a large church, saw the sarcophagus of St. John. They have here also a Pitcher which the Queen of Sheba gave to King Solomon, Gothic Striped. The Annunziata, we also visited, the University, the Regal Palace. The Palazzo Ducale. In this is a splendid Hall which was filled with fine statuary but destroyed in the Revolution, have been repaired by plaster &c. In this same Palace is the Great council chamber, adorned by beautiful Fresco representing the Landing of Columbus in America, but strange to me all are white!! At the other End is the consecration of the remains of St. John. These are copies from the famous paintings by Solimena, the originals were destroyed by fire. The Prow of the Carthaginean ship which was found in the harbor is removed to the Musee—Palazzo del Monsig. Giacomo Filippo. This is one of the most splendid Palaces of the city of Columbus—the Portes in these palaces are magnificent from their structures of marble—the pillars & stairs are grande. It contains a large collection of Paintings by the old masters—as Castello, *Guercino, Guido,* Titian, Carracci, Rubens, Paolo Veronese &c. &c.

Palazzo de Serra has one of the most magnificent rooms in Europe called the Saloon of the Sun—"Salon du Soleil." It is said to have cost 300,000,000 of Francs. It was covered with gold, Lapis Lazuli, & Mirrors. There are some good paintings here. The Floors here are made of a plaster—hard, varied in color and presenting a splendid appearance. Visited here the Palazzo Brignole—& Pallavicini—all splendid for their paintings in Fresco—in Arabesco and in oil & water.

The Palazzo de l'Université—Here we saw the several rooms of Law, Theol. medicine, Philosophy, &c.

In one of the churches here I saw for the first time the Eternal Pere depicted—Horrid idea—unworthy all civilized beings. 2 hospitals here & a medical school connected with the University and its Reputation is good. There is here also the Regal Palace in which there is one of the most valuable paintings extant. Mary Magdalene at the feet of Jesus at the House of the Pharasee by Paolo Veronese. Genoa is in short a beautiful city, containing in 1837 120,000 inhab. The Hotel d'Europe I found very good. The Promenades of the city are very good and the people appear very much better than any I have seen out of Paris. At 6 we again went on board of the steam boat for Leghorn or as they call it here Livourno. We however did not leave the Harbor until after 7 and on account of a mistake on the part of the Police in sending back to Marsielles three passports which proved to be *ours* we were at first vexed, but ultimately concluded to make the best of it and get new passports at Leghorn.

4. Tuesday. This mng. at 8 we reached Leghorn—were glad to see the American flag floating in the Harbor. Seemed nearer in relationship than I had ever before felt it. Our first business was to arrange our passports, we called upon our Consul, an Octogenion—by the name of Appleton. Next got our Café, then a veturino and started for Pisa—for we were now in Tuscany. The distance 14 miles, *good level* road, we were struck with the appearance of the country, people &c. looked poor. Men & women were at work together in the field, reaping and haying. No barns, stack their hay and grain. Thrash their grain either by treading or by striking the heads over a piece of wood. Work cows as oxen. Their plough is a crotched stick somewhat as in the time of *Virgil*. We reached Pisa, a walled City, now containing about 20,000, once contained over 100,000. It is delightfully situated upon the Arno in a magnificent plain. The Mediterranean seen from high buildings. The streets are wide and all flagged, instead of Paving. The Arno has 3 stone Bridges—Quays extensive. We hastened to see the *leaning tower*, the wonder of the world. It was begun in 1175, has 8 stories 190 feet high & contains 7 Bells, it being the Companile of the Duomo. It inclines 13 feet from the perpendicular. It is composed of granite & marble. The Custode said it was so built in the beginning. It probably was not. The view from it is very grand and extensive. The *Aquaduct*, the Baths, warm, about 3 miles out toward the Mountains may be seen, the Convent. The Farm of the grand Duke of Tuscany.

The Duomo is one of the most splendid in Italy—very rich in its structure—and decorations. There is a famous bronze door some 800 years old. The Baptistry and Campo Santo are objects of much interest. The Pulpit in the Baptistry is very fine, beautiful basso relievo. There is a University here, one of the three in Tuscany; it has enjoyed a high reputation. The climate of Pisa is thought by some to be the finest in Italy. The city is very old, settled it is supposed by some followers of Nestor soon after the fall of Troy. There are relics of works made here by the Romans, as Nero. Our visit here was much too short. We returned again to Leghorn about which I must say a few words. It is a fine walled city of 70 or 80,000 inhabitants, was the first free port in the Mediterranean, and a place of more mercantile trade than any Italian City. You see a motley group of all nations here and you hear all languages. Some fine streets flagged like Pisa. This place was made by the Medici. The English burying ground is an object of notice, here lies the great Historian, Smollet. The statue of Ferdinando 1 is in the ship yard—with 4 large Bronze negros chained to the Pedestal. At 5 we sail'd again for the Roman states. The sailing was very pleasant in the evening, the Island Gorgona was in sight and in the night we passed near Elba where Napolean was placed for security. Our company on board was composed of English, Americans, French & Italians.

5th. Wednesday—This day at 11 A.M. we arrived at Civitavechia. Here was our first introduction to the Pope's power. This is the only port of any magnitude belonging to the Pope, a walled city, some 20,000. Freeport in its trade, was first built by Trajan and called in his time the Portus Trajani. It has a large breakwater made by sinking stones to secure the harbor. In landing we had some trouble, the men actually fighting among themselves to obtain the small service of taking our Luggage ashore. It was taken into a strong walled building to be overhauled by the Police; then we went to the hotel, got a poor Dinner and made a party of 5 to go to Rome, the distance of 47 miles; a French Lady & her son. She was worth her weight in Gold to travel with, she made the bargain with the Veturino to take us to Rome and the writings were drawn and at ½ past 3 we were ready to start, come weal or come woe, in *night travelling* in Italy.

We were beset again [by] the custom house officers before we could leave the city. Our Luggage was taken, overhauled and *Plumbed*, this last operation was to obtain money, and which in this case did us more harm than good for we were obliged to go to the Dogana at Rome and suffer another vexatious examination.

We had some small Helices which we picked up at Vaucluse which were taken from us lest we should convert them into Cameos.

At about ½ past 4 we got off from these *dogs* and wended our way for some distance along the shore of the Mediterranean. The view of the sea was pleasant, the Road was tolerable, the weather very warm. We passed through no villages but the whole country seemed a waste. We saw in the fields some large droves of horses, not restrained by fences for there are none and we saw large Herds of the finest cattle I ever saw in my life, all mouse colored. Horns long and upright and black—We passed some old castles & buildings and 2 or 3 poor Inns. At 10 we stopped for an hour and baited horses & got some little refreshments, horses & ourselves all entering the same door. The Via from Rome to Civitavechia is called the *Vetellia*, the gate being upon Mons Janiculus. There were two objects of dread in this night's travel, first the Italian Robbers; being without arms I put my gold into my Boots, hoping thereby to save that if I was assaulted. 2d. I feared the malaria of the Compagna di Roma. We reached the Gates of Imperial Rome as she once was at 6 in the mng. It is impossible to describe the feeling with which I viewed the walls of Rome. I entered and asked myself the question, is it possible I am where the Godlike Romans once were? My feelings, my thoughts upon the kings, the consuls, the Emperors, the Poets, the orators, the statesmen, the Generals. Where were they? Gone and with them had gone two thousand years to be swallowed up in the mighty ocean of time. The work of their heads & hands still survive to astound the wondering traveller.

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AN INTRODUCTION TO THE HISTORY OF WOMEN IN MEDICINE

II. THE MEDICAL WOMEN OF THE MIDDLE AGES (*Continued*)*

By KATE CAMPBELL HURD-MEAD, M.D.

HADDAM, CONN.

FIFTH CENTURY

But suddenly, after two short years of peace, Alaric with his hordes of Goths descended upon Italy; Rome was sacked in A.D. 410, and once again everything was in turmoil and confusion. Thus, as the fourth century merged into the fifth, the condition of the Roman Empire grew worse each year. The Campagna was one vast marsh, the drains were clogged, malaria was endemic, the great granary of North Africa was not producing its quota of food, nor was wheat coming from Britain or Spain or Gaul. The Picts and Scots and Saxons raided Britain, the Visigoths invaded the regions south of the Danube, the Vandals became masters in Spain, and the Franks were making great headway in Gaul. Freebooters and pirates roamed the seas. The Legions were hastily recalled to Rome in 407, but they were neither strong enough nor sufficiently patriotic to win the day against Alaric who took the Eternal City in 410, claiming tremendous booty including three thousand pounds of pepper.[1] They spared the Christian population but damaged their property, especially works of art, and books which they could not read.[2]

Thus the Roman Empire, from a homogeneous domain of sixty-four provinces, was becoming split into a heterogeneous mass of uncultured peoples that had poured into Italy from the east and north. These foreigners soon became fused with the Latins and Greeks of the south and west, but not without fight after fight, until we can only wonder that by the time of Totila, in the middle of the sixth century, there was anything left to conquer or destroy. The good military roads throughout the Empire had given the invaders easy routes to Rome, and the more modern weapons of the enemy had been turned effectively against the old walls of the cities along their routes. As for the navies of this century little can be said, for there was little distinction between the private or public boats of the Romans or of their enemies.

The picture of the nations looks dark indeed and even darker when we find that the one brilliant woman of the first half of the fifth century, Hypatia, a great mathematician and philosopher, as beautiful and good as she was learned, was brutally killed by a mob as a heretic, in 415, by order of a Christian bishop, Cyril of Alexandria. From that moment Alexandria lost its prestige as a teaching center, and the pupils went to the more liberal school at Athens which offered them many inducements for study and

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[1] La Wall, C. H. The romance of spices, *Am. J. Pharmacy*, 1923.

[2] Holmes, W. G. The Age of Justinian and Theodora. 1912, Vol. 1.

* Previous installments of this article appeared in the ANNALS, n.s. 5: pp. 1 (Jan.), 171 (March), 281 (May), 390 (July), 1933.

especially for the study of medicine. The teaching consisted in the reading and explanation of Galen, Hippocrates and Dioscorides, the humoral theory of disease, and the use of the animal and vegetable remedies advocated for centuries. The medicines were all included in a new gynecology written for women doctors by a man named Pincranus but, unfortunately, it was without one idea not found in the works of Cleopatra or Aspasia or Soranus.

In the year 420 the Empress Eudoxia, wife of Theodosius, a very well-educated woman and a zealous Christian, founded a new hospital in Jerusalem where she personally tended the sick and prescribed for their infirmities. She also aided in the re-establishment of two medical schools, one in Syria, and the other at Edessa, in Mesopotamia, east of Van, where the Nestorian Christians had been teaching. The Nestorians taught in the Syriac, Persian, Greek and Hebrew languages, but as they were inclined to the Unitarian doctrine, the orthodox Christians united to drive them from Edessa. They were allowed, however, to settle in Persia, where the Queen, a granddaughter of Zenobia, as we have seen, was a most liberal and learned woman. She had sent to Greece for physicians, and to other parts of the world for books and scribes, so that it was not difficult to establish a new medical school at Gondeshapur, or Gonde-Chapur (the name of the place is spelled in many ways), where men and women studied together, translated the Bible and medical books into several languages and treated the sick, until it rivalled Athens and Rome as a medical center.

Nestorius, born near Mt. Taurus, was consecrated patriarch of Constantinople in 428. His heresy consisted in denying the dual nature of Christ and the divinity of Mary. As his views were quickly spread throughout Persia, Armenia and Syria, they were subject to heated discussions which led to the separation of Christians into sects. Nevertheless, Nestorius was a great organizer, and at Gondeshapur, where there already was an institution of higher learning, his new medical school became very popular with men and women because it was so cosmopolitan, even Hindus and Buddhists and Jews being treated as cordially as Christians. The Jews, by the way, kept their religion quiet, for they were in great favor as physicians but not as Hebrews. Saint John Chrysostom, for example, said it were better for a Christian to die rather than be healed by a Jew.[1]

The medicines recommended at this school and the prescriptions were somewhat like those of India, written on leaves of the palm tree and neatly fastened together, as in remote times. The Bower Ms., of the fourth century, may have been in use at Gondeshapur. It purports to be a dialogue between Buddha and his inquirers as to certain remedies for diseases, the chief of which was called chebulic myrobalam, a universal blood purifier.[2] It was used to cure everything but lockjaw, stricture of the throat, and consumption, and it was not to be given in pregnancy. As a digestive it was prescribed with ginger, molasses and rock salt. It was supposed to promote intelligence and sensibility and to regulate the flow of bile. Taken with castor oil it cured constipation. The one rule for its use to be absolutely obeyed was this: "Five pellets that have lain for seven days in the urine of a buffalo must be eaten for seven consecutive days with milk and a diet of rice"; this prescription if strictly adhered to for three times seven days was said to cure dropsy, all abdominal swellings, and all liver trouble. The myrobalam was originally grown from tears shed by a god, hence its power.

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[1] Meyerhof, M. Notes sur quelques médicins juifs-égyptiens qui se sont illustrés a l'époque arabe. *Isis*, No. 37, vol. 12, Feb., 1929.

[2] Archeological Survey of India. Ed. by A. F. R. Hoernle. Vol. 22, 1912.

But, unfortunately for the progress of medicine in this century, there were no original investigations, and such remedies as those just cited could not, even with faith, cure any disease though the patient might survive the doses. For this reason Christians began again to rely upon holy relics, to hang in the churches wax models of their diseased organs, and to revere dreams interpreted by saintly men and women.[1] We hear of a certain Theodoric of Alexandria[2] who had been poisoned. He was told in a dream to swallow a live asp, but in making the trial he vomited so abundantly that he got rid of all the poison! Mirabile dictu! No wonder that we hear no names of physicians connected with such medication, for the educated medical men and women must have been busy copying manuscripts and attending to their routine work, none of which seemed worth recording.

The chief business of this dark century,[3] apart from actual war, was to decide certain theological questions such as the divinity of Mary, the amount of power to be wielded by the clergy, and the question of the responsibility of women in church services, and the number of angels who could dance on the point of a needle. Evidently these questions were then settled to the satisfaction of the prelates, for Mary was considered divine, the church obtained more and more temporal power, and women were more and more forced into retirement by the clergy. This was five years after the migration of Attila (who died in 455) and the half million wild Huns who overran Europe as far as the Rhine. The Niebelungenlied has celebrated the feats of this hero, called Etzel, and tales about him were followed by others about Clovis, or Chlodvig, who invaded France and fought against heroic women of whom Brunhild was a type. Then from the north of Italy came Theodoric of Verona, the great Diedrich of song and story, crushing everything in his path and setting up his kingdom in Ravenna in opposition to the rule of Justinian in Constantinople.

Southern Italy during these perilous times was ruled by Pope Gregory the First, who paid his army for twenty-seven years with the revenues from the Church. There was no peace anywhere. Before 475 there had been nominally ten new Emperors while barbarian chiefs ruled in Spain, Gaul and Africa, and the Teutonic invaders were rapidly becoming masters of England. "At such a period," says Villari,[1] "slaughter, pillage, and incendiarism left few original documents to illustrate the history of the Roman Republic," or, let us add, of medical men or women, for, notwithstanding theological quibbles and political quarrels and actual wars, the work of medical women must have been continuous everywhere.

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[1] Withington, E. T. *Op. cit.*, p. 123.

[2] Crump, C. G. and Jacobs, E. F. Legacy of the Middle Ages. 1926, pp. 28–30.

[3] Singer calls this the beginning of the dark period of the World of Science. It lasted a thousand years.

[1] Enc. Brit. Art. on Rome, by Villari. Ed. 14.

Someone has said that it is from the laboratory alone that new or worthwhile advances in medicine can be evolved, certainly not from philosophy or religion; but as the bedside should be a doctor's laboratory we should have obtained from these early Middle Ages a great accumulation of records to show the work of the men and women who visited the sick in their homes or treated them in the dispensaries or hospitals. Such was not possible, however, for the Church felt that every disease should be made to fit the theories of Galen, from which to deviate a hair's breadth was considered heresy. As was the case in the oldest historical times in Babylonia and Palestine, any European doctor in the early Middle Ages was obliged to pay a heavy penalty if a patient died under any other treatment than that prescribed in the books of the Roman master. We hear that Gontran (or Guntram), king of the Franks, beheaded two doctors for not curing his wife of some malady, "for," says he, "she must not enter the Kingdom alone."[1]

This suggests to us the old saying, "Happy is that country whose annals are blank." Certainly in the fifth century there are blank annals as to the medical work of women but not of a military kind, for, from China to the Atlantic there was no peace, no respite from wars or sickness, and no time for quiet writing. Garrison[2] says that even intelligence was undergoing decomposition and becoming effeminate. Perhaps it would be nearer the facts to say that men and women were changing places, and although men were not becoming effeminate they were cultivating merely their fists and women were doing all the studying. Through a surfeit of war and insurrections men were perhaps degenerating while women in general for the same reason were becoming braver, more virile and more reliable. Although scarcely known except in their own neighborhoods, and treated like menials, medical women of the fifth century were obliged to perform surgical operations, care for the lepers, soothe the fevers of children, and help women in labor. They were not unwilling to treat the sufferers with their own hands and in whatever way they thought best, to wash infected wounds and set broken bones, and to teach their attendants and nurses how to prepare diets, lance boils, and bleed their patients. We see scenes like this depicted by later artists evidently from tradition, and we are prepared to believe that, since men's and women's costumes were generally patterned alike except for war or special occasions, many mistakes have been made in the past, ascribing to men the medical work actually done by women. Certainly there was nothing impossible for women to learn in the treatment and diagnosis of disease according to the period. Oribasius, by order of Julian the Apostate, had prepared a new edition of Soranus for them which was easily committed to memory if not so easily copied.

When we realize that every book then used by men or women was merely a copy of one of the old masters with or without notes, and that handwriting then as now must have varied and been more or less unintelligible or difficult to decipher, we can feel special sympathy for all those who needed books or could only borrow inferior copies. It is small wonder that names of authors meant little and were often misspelled or omitted as unessential, or were wrongly translated from Greek to Latin, or occasionally into the vernacular. Singer[1] tells us that even in the tenth century there were only fourteen medical authors whose works were then used by the teachers at the schools. These were our old friends Hippocrates and Galen, Dioscorides and Oribasius, Soranus and Musa, Priscian and Apuleius (a sixth century writer on plants), Boëthius' Aristotle, Moschion the gynecologist of the sixth century and Cleopatra of the first (?)—written like a quiz compend—and Firmicus who wrote at Constantinople on astrology and its influence on birth, and Paul of Aegina of whom we shall know more later, and Aëtius of Amida of whom we have already learned a little.

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[1] Crump and Jacobs. *Op. cit.*, p. 28.

[2] Garrison. *Op. cit.*, p. 82 (Ed. 1914).

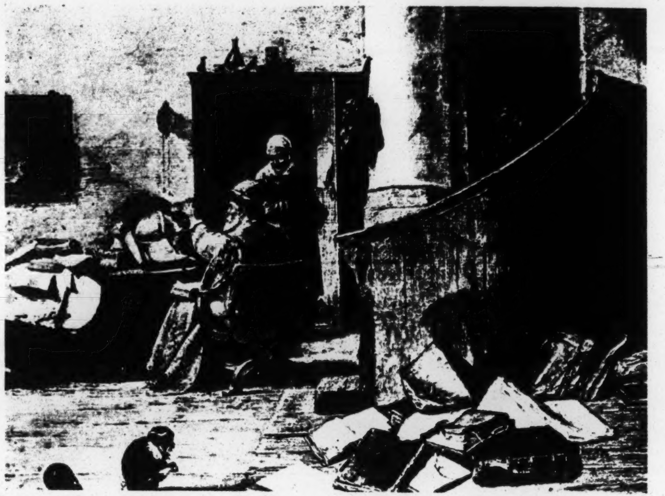

Fig. 32. Medical Consultation, by D. Teniers, Seventeenth Century (Original in Städelsches Institut, Frankfurt. A. M.) The Doctor Holds a Flask of Urine. Another Flask Stands above the Door beside an Hour-glass. Note Clock, Monkey, Chair, Globe, and Patient. Optical Examination of a Flask of Urine Was About the Only Medical Interpretation Allowed a Man Doctor. There Were Many Specifications to Be Noted: Color, Odor, Taste, Deposit, Clearness, Etc.

It happened that during the reign of Theodoric the Goth, at Ravenna, an elaborate set of rules had been promulgated to govern the social behavior of a doctor. His clothing was to be dignified and unostentatious, his prognosis ambiguous; he should seem important and learned, but circumspect in demanding a fee. These evidently were the rules of some medical society, but whether or not the people were impressed with the worth of physicians in general, there were times when an obstetrician was indispensable, and it must have been as difficult then as now to "bluff" a woman in labor. Relics of a saint, or the sight of an ascetic like Simeon

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[1] Singer, C. Origin of the Medical School of Salerno. Volume presented to Sudhoff.

Stylites on his pillar, night and day for thirty years, or the vision of the human beings who tried to live on grass like an ox, or of those who stretched themselves on spikes to be fed by ravens, might impress a patient with imaginary complaints, but to care for a woman in labor, a child with the colic, or to set a broken arm, or to soothe the sores of leprosy, the practical work of trained medical men or women was absolutely necessary.

It seems almost hopeless to look for the names of the apparently anonymous women who must have given most of the practical treatment to the lame, the halt and the blind, while the men compiled books or took the trouble to glance at the flasks of urine taken to them for diagnosis. And yet, as in the centuries before Christ, the evidence of the tombstones is evidence enough that it was no uncommon thing for women doctors to be buried with honor by their parents, children, husbands, patients or slaves. Here, for example, we may mention a few examples of gravestones from Christian burials of perhaps the fifth and sixth centuries after Christ,[1] signed with the cross or fish, or "*In pace.*" (1): "To my sainted goddess Primilla, a medical woman, daughter of Lucius Vibius Meliton; she lived forty-four years of which thirty were without trouble, with Lucius Cocceius Apthorus, who erected this monument to the best and purest of wives and to himself." This marble tablet is in the Berlin museum; Primilla may have been born a pagan since she was married at the age of fourteen and seems to have been educated in medicine and saved by her loving husband from a pagan's grave.

Another important tablet (2) found in Capua is to a *Magistra in Medicina.* At Cori is another (3) to a magistra; and still another (4) in Cervaria is to Sp. F. Fortunata, *Magistra,* Matri. Matutae, D.D. Paul. Tontia, M.F. Consua Piatrices.[1] In Padua there is a stone (5) to a Magistra Proba, Petrusia.[2] A stone (6) found in Lyons, France, reads: *Metillia Donata, Medica. De sua pecunia dedit;* meaning that Metillia paid for her own stone. There is also a stone (7) to Julia, wife of Quintus Julius, a Sabine woman doctor, or, as another translator reads the words, it means that Sabina, a doctor was the freed slave of Julia Quinta, so ambiguous is the wording. It is often difficult to decipher the inscriptions because of the omission of letters for the sake of economy, the decay of the stone, and the absence of explanatory notes to legends that were obvious fifteen hundred years ago. There are however, clear letters (8) to "The daughter of Nicenus, a freed woman belonging to the woman doctor Terentia, to whom the tablet was erected by her grandchildren."[3] From Spain and the old Roman city of Merida near the Portuguese border, comes this inscription: (9) To Julia Saturnia, aged 45, an incomparable wife (*mulieri sanctissime*) and the best of doctors (medicae optimae) erected by her husband, Cassius Philippus. *Maritus ob meritis.*[4] Merida was a large and flourishing city before the seventh century and the arrival of the Saracens. It still has the remains of a fine theater, a magnificent temple to Mars, a very early Byzantine church to a martyred saint Eulalia, a long Roman bridge and other striking remains of its former splendor, so that if we know of one woman doctor in Merida, there were probably scores of others whose gravestones have not as yet been discovered. Merida is today a poverty-stricken city of scarcely more than ten thousand inhabitants, difficult for the hurried tourist to visit, and therefore not a show place, but we can not but believe that from its position on the river it may reveal splendid treasures to modern excavators.

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[1] See Gruter; Henzen and Rossi; and Hübner, Inscriptions; see also Part 1, Rome.

[1] Gruter, p. lx.

[2] Gruter, p. lxxxix.

[3] Henzen and Rossi, no. 9616.

[4] Hubner, p. 62, no. 497.

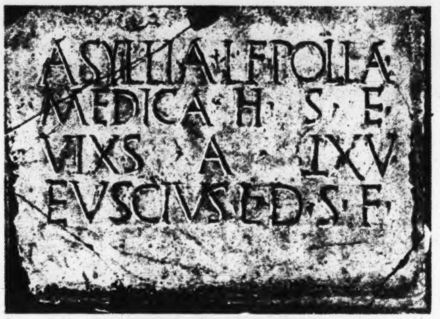

FIG. 33. TOMBSTONE OF AN EARLY CHRISTIAN MEDICAL WOMAN.

ASYLLIA† L F POLIA
MEDICA† H.S.E.
VIXS. A. LXV.
FUSCIUS. L. D. S. F.
Asyllia L(ucii) f(ilia) Polia
Medica h(ic) s(ita) e(st)
Vixs(it) a(nnis) LXV
Fuscius l(ibertus) d(e) s(us) f(ecit)

There are many such gravestones along the Appian Way, near Rome, one of which is to (10) "Empiria, aged 49 years, wife of Vettianos of Cios, erected by her husband because of her medical skill." And another (11) now in the Vatican, is to "Valeria Berecunda, aged 34 years, 28 days, *Iatromeia*, of Rome, erected by her husband and daughter, for she was the best doctor in her quarter of Rome."

There is a fine inscription which was found in Tarragona, near the east coast of Spain, south of Barcelona and not far from the great Cyclopaean wall; it is in the shape of a Christian cross, but it reads like a pagan legend: (12) "*D.M. Juliae. Quintianae clinice. Fil. Karissim.* Mater Posuit et si . . . bi," or "Julia of the Quintius family, a *clinician*, most dear daughter. Mother placed this stone to her."[1] There were many such reminders of incomparable daughters, best of mothers or wives. (The title *clinician* is not so common as *medica*.)

In another of the Roman colonies, at old Carthage on the north coast of Africa, there have been found scores of Christian burials among the relics of the old Phoenicians of the time of Queen Dido and her pagan gods. There, close by the ruined temples of Tanit and Baal, with their votive offerings of miniature legs and babies and breasts, are found remains of martyred saints and Christian crosses. Among the gravestones are several to men and women doctors, nurses, *maias* and *obstetrices*. One of these stones, now in the museum of Carthage (collected by Père Delattre), is a small but very beautifully inscribed tablet to a woman doctor, Asyllia. The slab is of dark green stone, about 30 × 25 cm., and it reads, (13) "Here lies Asyllia Polia, daughter of Asyllus. woman doctor; she lived sixty-five years. Fuscius, her freedman, made (this tomb) at his own expense." (Fig. 33.)

We note the two crosses inserted in the lines, and the clearly written MEDICA, when the other words are abbreviated beyond the recognition of any but an expert in epigraphy. The translation was made by Professor Audollent, dean of the faculty at the University of Clermont-Ferrand, and published in the *Medical Revue* by

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[1] Gruter. Corpus Inscriptionum. vol. 2, p. 636.

Dr. Marie Derscheid-Delcourt, of Brussels, in 1925, together with the photograph of the stone. The translation shows the method of abbreviation in these stones. Many other stones have been re-erected outside the museum, one only to a nameless MEDICUS, but most of them have the pious "*in pace*" as though their lives had been wearisome indeed. We do not wonder that the Phoenicians from old Tyre and the Greeks and Romans after them fought for possession of the harbor and site of Carthage. The marble buildings rose in tier on tier above the blue sea facing the sickle-shaped peak of Bou Kornine, the mountain of Saturn, and it must have been a beautiful city when Vergil lived there.

What civilization would have been like in those troublesome centuries without the Christians it is difficult to imagine. Sarton says that the Christian religion was the one vehicle by means of which barbarous Europe was kept from far worse fate than medieval darkness. The fifth century at least kept religion and medicine alive and saved the Latin language, although not in its pristine purity. Great numbers of men and women fled to monasteries before the end of the century to find rest and peace,[1] and these institutions were springing up in the wake of Saint Patrick in Ireland and Great Britain, and of the hermit saints in Egypt, and of Saint Benedict in Italy and also in the Roman colonies. Not far from Alexandria and on the Nile near Memphis there were scores of anchorites in the desert, and twenty thousand nuns mortifying their flesh in what might be called asylums, where they copied books, sang psalms, and prepared for the next world. These enthusiasts were protected by the emperor, Justinian (483–565), and his energetic wife Theodora, who personally settled theological disputes and determined the correct forms of worship. Roman culture, however, was rapidly becoming mere tradition in Constantinople as elsewhere.

SIXTH CENTURY

At the end of the fifth century, Theodoric the Great, the Ostrogoth (454–526), was able to stem the tide of decay by the help of the Pope, and keep peace for ten years. His court was at Ravenna, on the eastern coast of Italy, and there he employed Boëthius (475–524) and Cassiodorus[1] (480–575) to foster education and culture. But in spite of his power Theodoric could not obtain the consent of the people to have his son educated, although his daughter, Amalasvintha, was able to speak many languages besides Latin and Greek and had studied Aristotle and all the liberal arts. Boëthius was writing what proved to be his final work on diet and hygiene, warning his readers against the use of pickled meats, spoiled fish, poisonous mushrooms, and bad cheese, and advocating a diet of bacon in intestinal parasitical diseases, and partridge flesh for dysentery.[2] But suddenly, everything was topsy-turvy again, Boëthius was executed in 524 on the charge of treason and the use of magic by Theodoric's son; the army of Justinian fought and conquered the Ostrogoths, and pandemonium reigned everywhere. Fortunately, Saint Benedict and Cassiodorus were then safe in their monasteries copying manuscripts in peace, and Theodoric was on the way to immortality as Diedrich von Bern, the hero of song and story.

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[1] Robinson, C. H. The Conversion of Europe. London, 1917.

[1] To Cassiodorus the basis of education rested on languages and mathematics. He discarded medicine.

[2] Neuburger, M. History of Medicine. Eng. transl., 1910, vol. 2.

While pestilences of all kinds raged in this century, charlatanism was flourishing as never before. Gregory of Tours (540–594), tells us that the bones of the saints worked marvellous cures, and we know that holy relics were multiplied to suit the needs of the sick. Dust from tombstones, wax from church tapers, and even incubation sleep took the place of doctors and drugs, and this represents the medical condition of Europe for two hundred years, or until the time of Charlemagne (742–814) and Alcuin, the Anglo-Saxon monk (735–804).

In England and Ireland, however, conditions were not so bad as on the Continent. The disciples of Saint Patrick, who died in 469, and the followers of Saint Augustine of Hippo, who had died thirty years earlier, were traveling back and forth between Rome and their western schools and churches, and they kept religion and education from stagnation. Bede (674–735) tells us in his history that during those years medical studies were not neglected in England. Monks and priests and leeches practiced their trade freely; their teaching was mainly from Aristotle (B.C. 384–322), whose ideas of anatomy and physiology were those of the centuries before Christ, and their medicines were scarcely better, being those of the early centuries A.D., while the rules for bleeding according to the signs of the Zodiac were from the early Middle Ages and unchanged. Shortly after the death of Saint Patrick, we find Saint Bridget (453–525) at work in medicine and midwifery in Ireland. She was said to be the daughter of a "druidess," converted to Christianity, and able to perform miracles of healing. However, she practiced medicine according to the methods of her age, went about among the poor and the sick at Kildare in Ireland, and was able to convince the rulers that quacks should be banished from the country. In the famous Book of Glendalough we find rules governing the fees for physicians, and other progressive legislation as well as laws against impostors. In later centuries the name of Bridget came to be revered, and many another woman of that name followed her example in opening hospitals and practicing medicine, as we shall see in a later chapter.

In Spain, among the Visigoths from the fifth to the eighth centuries, more laws were enacted against doctors than for their benefit. The worst of punishments were meted out to abortionists[1] and the tortures to which they were put were brutal almost beyond belief. Unskilful bleeding was punished with a heavy fine, and witnesses were called upon to testify to every operation. In Merida where, as we have seen, there has been found at least one tombstone to a woman doctor, the bishop of Spain, Isadorus Hispalensis (570–636), built an immense hospital of 580 beds on the bank of the Tagus and staffed it with men and women doctors and teachers from the school of the Nestorians at Gondashapur, in Persia. Here the Bishop himself compiled a great encyclopedia from eighty authors, as a textbook for the students.[2]

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[1] See Neuburger, Vol. 2, pp. 12–14.

[2] It has been said that Paulus, Bishop of Merida, performed caesarian section on a live mother, in this century, and saved both her and the baby.

At the same time under Justinian and Theodora, seventy thousand people of Asia Minor were forcibly baptised, and still further to root out heresy the medical school at Athens was closed in 529. Women doctors who were slaves still brought the highest prices in the market, however, for they had been given a careful education. Theodora (527–566) founded many hospitals for the sick throughout the Empire, after the plan of the hospitals of Fabiola, and erected orphan asylums like those of Tiberius, while in order to root out prostitution she opened homes where lewd women were kept under supervision. Public sanitation was considered so important that the household water for Constantinople was collected and stored in vast pillared cisterns under the city to keep it from pollution. These cisterns are among the amazing sights in the neighborhood of the church of Saint Sophia at Stamboul today. Aëtius of Amida (527–565) was kept busy at the court compiling medical manuscripts for students and writing his famous "Tetrabiblion," in which, as we have already seen, he quoted extensively from Aspasia and Cleopatra. The parts of his book dealing with gynecology and obstetrics were the main texts used by women doctors up to the time of Trotula of Salerno in the eleventh century.[1]

Among the women doctors quoted by Aëtius we find one named Andromache, an Egyptian of his own time, who is said to have had a very large practice. She used all sorts of remedies to cure pain and suffering, among which Aëtius quotes one for toothache containing pepper, pyrethrum, galbanum, etc.[1] For bruises, luxations, and ulcers she prescribed a black plaster of ground bone, gluten, wax, bitumen, pitch, oil, resin and opopanax (ginseng?). She evidently had read Pliny's pharmacopoeia, for Aëtius quotes such remedies as his from her book with the remark that Pliny was a clear fountain from whose waters all writers drew their supplies. Most of Andromache's treatment was, however, like that of Aëtius,[2] taken from Egypt rather than from India, except that she used the actual cautery instead of the knife in surgery, advocated the magic words of Samonicus, believed in the possession of devils, the laying on of hands, and in cures by the royal touch.[3]

As for the gynecological treatment and the obstetrics of this century we find Aëtius quoting page after page from Aspasia and Cleopatra, as has already been said. He seems to have gone further than they in describing dystocia of the pelvis as an impediment in labor, but like them he believes in podalic version, in placing dry sponges in the vagina to provoke the expulsion of a dead fetus, and of reaching with the left hand into the uterus to remove an adherent placenta. In his book on surgery he advocated the removal of a cancerous breast or a stone in the bladder, amputation of the clitoris in girls, and circumcision of little boys. He described hydatid mole, and he praised Cleopatra for dropping oil into the eyes of new babies, but, strangely enough, he also believed in taking as tender care of lucky stones as of children, and in using them according to definite rules.

[1] The "*Tetrabiblion*" of Aëtius was printed in the sixteenth century by order of Pope Clement VII, in 1534, in double columns; it contains 2000 pages.

[1] See Book IV, ed. of 1567, p. 467.

[2] Neuburger, Vol. 1, p. 333.

[3] Cumston, C. G. Introduction to the History of Medicine. 1926, p. 212.

From all this we may form some conception of the quiet and unassuming life of the women doctors of the sixth century. That they had public duties can not be doubted, nor that with all their gentleness they were no less strong than men in the performance of their work, but such a monotonous life is not interesting to historians. As it was becoming increasingly *infra dignitatem* for priests or monks to let blood outside the monastery or administer any active treatment, so, therefore, to the women fell the nursing as well as the prescribing of medicines.

FIG. 34. MOSAIC, PROCESSION OF SAINTS. S. APOLLINARE, RAVENNA. THEODORIC'S CHURCH. EARLY WOMEN MARTYRS BEARING PALMS AND CROWNS.

We can easily imagine the women doctors of this century hurrying along the narrow streets with their medical kits and torchlights on a stormy night to care for a woman in labor, or stooping in the fireplace to make a cup of hot calamint tea for a crying child, or filling a pig's bladder with hot water to warm the feet of a fainting pilgrim, or producing an opium pill and giving a cupping treatment for a headache. And yet, in 581, the Fathers of the Church were asking in all honesty whether or not women were reasoning animals or mere brutes without a soul. Logically they decided in the negative, and accordingly the decree went forth that women could no longer be given public positions in the dioceses. One century later permission was refused to allow women even to speak in meeting; "Non enim eis loqui permissum est, sed subjici sicut dixit lex."[1]

Fortunately, in the midst of such contradictions, Saint Benedict (400-453) and his sister Scholastica were free to go all over Italy while the plague raged helping the sick everywhere and teaching others how to be of use to suffering mortals. After the epidemic was subdued, Benedict gathered together a few kindred spirits and settled at Subiaco in the Sabine hills not very far from Rome to copy manuscripts for the glory of God, while Scholastica established hospitals in places of great need, and until she had trained nurses for the work she herself bathed the sick, gave them medicine and food, and prayed with the dying. Whether she kept records of her patients or wrote a single book is not known, but we do know that papyrus was scarce, parchment expensive, and old manuscripts with their writings erased were used again for fresh copies of the Bible or lives of the Saints. Often the copyists, for the sake of greater economy, wrote with such minute lettering as to make their words very difficult to read, but, fortunately, the underlying texts of such palimpsests can sometimes be deciphered and often are found to be more valuable than the overlying texts. Handwriting in those days was changing its style; every country was beginning to feel its own individuality in script, but often the illiterate monks in their cold cells failed to verify their cramped copy by comparison with the original of which they scarce understood a word, so that a garbled quotation from a corrupt translation of the Bible, or Aristotle, or Galen, was the result, and still more often the author's name was omitted entirely.[1]

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[1] Council of Nantes. Canon III, A.D. 660.

In 528 Benedict moved his "Order" to Monte Cassino, forty-five miles from Naples, fifteen hundred feet above the sea, where the monks continued their copying of manuscripts. But as time went on they grew more careless and their texts became even less legible; brigands and plunderers sacked and burned their cells, so that in the tenth century the "brethren" were moved down to Salerno, on the coast, where possibly they helped to found the great medical school that for a time led the world in productiveness, originality and fame. Boccaccio visited their monastery at Monte Cassino in 1350 and he could find no remains either of manuscripts or of the school.[2] Among the medical books that these monks had copied, however, we have a partial list of the fourteen which, according to Charles Singer (see p. 488) are the ones so often copied in the earlier and later centuries. Six hundred manuscripts from the Monte Cassino workshop are now scattered among the libraries of Europe, many of them difficult to read, although their "broken Lombardic letters" are sometimes quite clear.[1] The nuns, under Saint Scholastica, also copied manuscripts "with all their might," but whether they copied the Bible "in order to stab the devil," or copied medical books we can not tell, for neither names nor marginal references give us the least clue.

There was a terrible epidemic of plague during this century. Procopius tells how in 540 it spread from the ports all over the known world. It was said that from 5000 to 10,000 persons died every day in Constantinople, and their symptoms were those of the modern bubonic plague. Every pregnant woman died, for "there was no cure for the disease." Procopius added that many physicians fled from the cities, but the women remained to do what they could to help the sufferers and pray with the dying. His own mother was said to be one of these devoted women doctors whose only reward was to be found in the heavenly kingdom.

Fortunately, after this epidemic the remnants of the populations of

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[1] See article by Adamson, J. W. Legacy of the Middle Ages. Crump and Jacobs, *op. cit.*, p. 284.

[2] Daremberg, Ch. V. Geschichte der Medizin. 1861. Boccaccio said that many scraps of manuscripts or loose pages had been used by the monks for charms and amulets.

[1] Thorndike reminds us that nothing of any value in medicine was written during the thousand years between Leo the Great who died in 461, and Leo the Tenth, in 1521, when the Reformation was in its early years. He also says that almost the only records of contemporary events come from the monastic annals, and they are naturally not journalistic.

Europe had peace for many years. In southern Italy the Greeks and Romans and Jews lived together harmoniously enough. Gregory the Great (540–604) sent missionaries in 597 to Saxon England with the second Saint Augustine. Ten years earlier missionaries had been sent to Spain which had become virtually Christianized, so that, with France also quiet, Gregory of Tours could write his history, and with Italy peaceful, Alexander of Tralles from Asia Minor found time to copy and annotate another gynecology for women doctors, along with a book of Galen. It would seem that gynecology and obstetrics were well taught at a time when general medicine was almost neglected, inasmuch as there were few actual remedies for diseases and no knowledge of pathology. Paul of Aegina in the following century wrote that the only cure for the plague was to eat a raw lettuce leaf and endives, drink cooling teas, and avoid wine. How comforting must have been those cups of cold water, the cool hand on the hot brow of the feverish patient besides the prayers and holy relics carried by the nuns, and the carminative herbs with which the women doctors must at least have tried to mitigate the suffering!

Although it has seemed that there were almost no women doctors or midwives known by name in the sixth century, we suddenly find that in Constantinople, Germany, and in France there were Queens who had studied everything worth studying, including medicine, and when they became unhappy in their royal isolation they seemed to find joy in caring for the sick according to the dictates of their own consciences and the knowledge they had acquired of materia medica. One of these queens was Clotilda of Burgundy, wife of Clovis I (465–511). She was a Christian princess, married to Clovis I in 493, after converting him to Christianity. Gregory of Tours tells us that she built a church to Saint Geneviève, and then, during the Burgundian war she retired to the monastery of Saint Martin of Tours where she spent her time in caring for the sick and wounded. Clotilde died in 544 and was sainted for her good deeds.[1]

The second of these sixth century medical queens was Radegonde, wife of Clotaire I (497–561), the son of Clovis I. She was a princess of Thuringia, an independent kingdom extending from the Danube to the Elbe. During the reign of Attila there had been many battles for the establishment of geographical boundaries, and Clotaire had fought to reunite his father's kingdom of Burgundy with those newly inherited. He seized Radegonde,[2] the daughter of his enemy, and made her his fifth living wife. She was then a high-spirited girl, and this arrangement was entirely against her will, especially as the other wives were not congenial to her. She had, however, her own palace at the court and here she assembled all the lame, sick and blind beggars of the region, studied their diseases, and from her own medical books decided how to treat them. Sometimes the learned men of the court were her teachers and consultants, and she soon became very skilful in diagnosis and cured all sorts of ailments. In her religious zeal, however, she went to excess in kissing the feet of her patients and drying their wounds with her long hair. To her husband at the same time she was still cold and unfeeling and this so angered Clotaire that he killed her brother. Then Radegonde fled (542) from her palace to a convent in Poitiers founded by her friend Cesaria, who at that time was Abbess of a very large convent at Arles in Provence, established by her brother in honor of Saint Martin of Tours. Radegonde later became the Abbess at Poitiers, and devoted herself to writing religious dramas, until, in 550, from pious enthusiasm, she sold all her jewels and built a large hospital where she employed her time in caring for the sick and in training two hundred nurses to follow her example in medical work. They set bones, dressed wounds, prepared remedies, made bandages, and spent their spare time in copying manuscripts. Many rich women gave Radegonde money for her hospital, while Clotaire himself saw to it that she never was in want for anything. It was said that Radegonde "shrank from no disease." She died at Poitiers in 587, and wonderful cures were made at her tomb.

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[1] Kurth, G. Saint Chlothilde. 1897.

[2] Kavanagh, J. The Women of Christianity. 8512, pp. 59 ff.

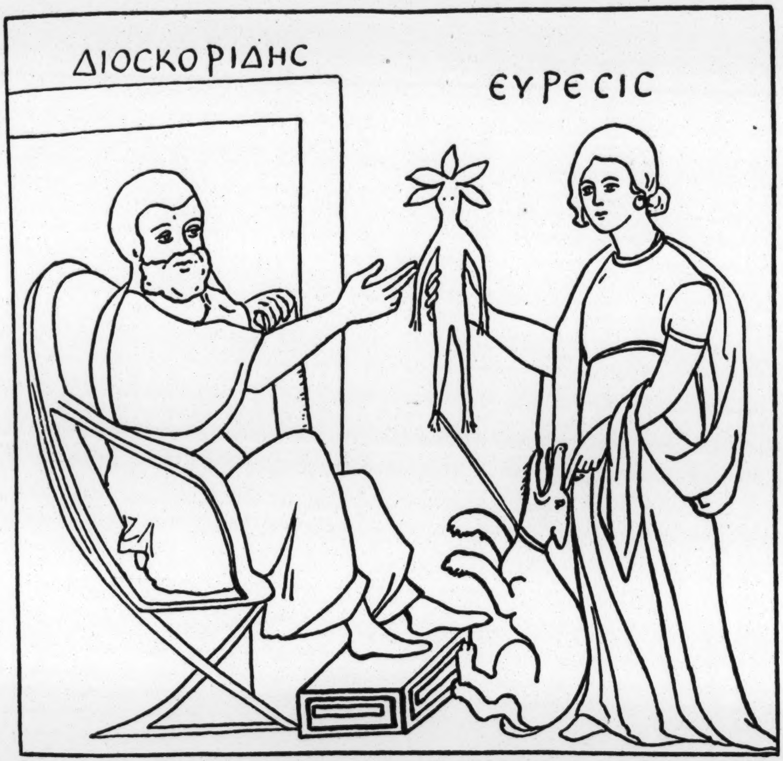

Fig. 35. Scene from the Julia Anicia Codex, a.d. 512. The Nymph Discovery Presents a Mandrake to Dioscorides. ((From Charles Singer.)

The third royal medical woman of this century was Julia Anicia, daughter of the Emperor of the East. She was born in 472 at the palace in Constantinople, studied medicine under the Greeks and Persians of the Court, and was personally interested in the hospitals. To her, as a wedding present, was given a beautifully illustrated copy of Dioscorides, dedicated to her in fact, in 512. This was the most valuable materia medica and botany of the time. It had been written originally by Dioscorides, the physician of Nero, A.D. 60, but had been somewhat changed by copyists. When it was first printed in the sixteenth century its illustrations showed the portrait of Julia Anicia as the Goddess of Intelligence and Discovery. In her uplifted hand she holds a mandrake, its head crowned with a radiating halo, its root-like feet tipped with toes. In another outline illustration Julia hands a mandrake to Dioscorides, who is distinguished from Julia chiefly by his beard, the usual mark of well-to-do fifth century men whose long robes and small caps or hoods are similar to those of women; the poor dog whose life was sacrificed to obtain the root is gasping his last breath at her feet.[1] Some of the outline drawings of plants for this volume were copied from an earlier work by the artist Crateuas who lived in the first century before Christ.

There was yet another royal medical woman in this century who became famous for her work for the sick and for lepers. She was Theodolinde, wife of Agilulf, or Ago, King of Lombardy in Italy, to whom Gregory the Great gave an iron crown said to have been made from the nails of the true cross. This present was in recognition of her great benevolence and medical skill, and the iron crown was worn by every king of the Roman Empire at his coronation.[1] Theodolinde died about 590.[2]

Seventh Century

Coming now to the seventh century we find that once more it was the strongest tasting and most disgusting of remedies that the people of Europe craved along with holy relics for the treatment of disease. These remedies were to be gathered or bought according to certain rules or at high price. The mandrake, a plant of the potato family, was to be pulled from the earth by a dog which then dropped dead on hearing the cries of the plant. It was used for quieting pain, facilitating pregnancy, and making labor easy, or for acting as a love philter. We have seen that the Hebrews of the time of Jacob believed in the power of the mandrake to cure sterility. Plants with black berries were taboo as they had been among the devotees of Isis in Egypt,[3] but those with white berries, like the mistletoe, were supposed to ward off evil spirits. Animal remedies continued in favor, and exotic remedies of all kinds were carried from place to place by commercial travelers. In Egypt the remedies of the so-called Druids were sold in exchange for poppy seeds and the preparations of animal products, unicorn horn, mummy powder, etc. Theodore of Tarsus arrived at his See of Canterbury in 671, bearing with him many a plant from Asia Minor, the use of which he taught to the monks. He also gave them new rules for bleeding and cupping. In return, King Offa of the eighth century sent doctors from England to Rome to rebuild the old hospital of Esculapius according to Christian plans, and to teach the Romans the use of British remedies.[1] The foundations of Offa's hospital and those of pagan times may be traced today beneath the modern hospital of Saint John of Calabita on the island in the Tiber.

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[1] Singer, C. History and Method of Science. Vol. 2, p. 12, shows a particularly fine drawing of the sow thistle with its roots and buds and seeds. There are other illustrations of plants from sixth century manuscripts in Singer's "From Magic to Science," 1928.

[1] Kavanagh, J. The Women of Christianity. 1852, pp. 59 ff.

[2] Our modern system of dates was the invention of Dionysius Exiguus who lived in the first half of this century. Bede and other historians dwell on this fact.

[3] Wehrli, G. A. Essays on the History of Medicine. Ed. by Charles Singer, p. 385.

We have already seen that Theodoric the Great had taken considerable interest in the advance of medicine in his kingdom, and that during his time it was the duty of women rather than men to care for the sick and especially for women in labor. We have also learned that operations of any kind had to be performed according to Galen, for otherwise, in case of accident or death, the family of the patient might demand enormous sums of money or even the death of the doctor. Therefore the inspection of the urine and a prescription for medicine were about all that was expected of a man doctor, while the monks used only holy relics in their treatment. It is small wonder that itinerant Jews were popular as surgeons in every country, for they, though disliking surgery and all contact with disease, were willing to undertake anything for a good price.[2] Jewish physicians, men or women, were obliged to wear a yellow spot on their long robes to indicate their nationality, and in later years they had to live by themselves in a ghetto or Jewish quarter of any town.

For many reasons, therefore, throughout the northern part of the Continent of Europe during the Middle Ages women were everywhere recognized as good physicians, while monks as a rule gave themselves to the task of copying medical and religious texts. It has been hinted that some of these women were of low moral character. We can easily believe that, being human, there may have been a few who were not true to their great calling, but certainly to many the practice of medicine was but a preliminary path to a seat beside the Blessed Virgin in Heaven, whereas the punishments for immorality were without measure, both on earth and in Purgatory.

Since, however, there were women who were somewhere and somehow educated especially for the practice of medicine, they evidently with moral fortitude took the risks of earthly punishments for failure in their cuppings or bleedings or setting of bones rather than incur punishments from "On High." At any rate, though we do not know their names we must believe that because the world had need of them women were giving the sick what treatment they seemed to need, and to the best of their ability.

But where did these women study in the seventh century? The answer is that those who could afford the expense went to Alexandria, where from the middle of the sixth century was the best of the existing medical schools. Mohammed, the Prophet of Islam,[1] was born in 570, and while he lived the Christians in north Africa were not disturbed, but after his death, in 632, his followers were fired with holy zeal to kill all heretics and their belongings. Therefore, we may suppose that Alexandria and its books were destroyed before 640, and the Christians who were not able to flee were massacred.

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[1] For a type of the traveling Englishman in all ages see Mead, W. E. The Grand Tour in the Eighteenth Century. 1914.

[2] Baas, H. Outlines of the History of Medicine. Trans. by H. E. Handerson, p. 249.

[1] It took no more than seventeen years to give Mohammedanism the impulse from which it has never yet ceased to go forward. Muslim chronology dates from the time of Mohammed's life in Medina in 622. (See

However much we may deplore the burning of this library at Alexandria, if the usual story is trustworthy, it is probable that most of its books had been copied and were to be found in some of the other libraries of the world. As for the materia medica of the seventh century, there was scarcely anything in Dioscorides and his followers worth keeping. A cure for epilepsy, for example, was to lie on the ground and breathe into a hole in the turf; human excrements were still used as medicine along with magic and exorcism. Thorndike says[1] that the Merovingian period (the fifth to the eighth centuries) was "a desert of medieval Latin in which a scholar could not tarry long without perishing from intellectual thirst." The men were no more scientific or original than the women. Galen's methods as we have seen were used by command of the Church along with prayer and the touch or sight of holy relics. Theophilas, the head physician of the imperial body-guard of Heraclios of Constantinople, 575–645, compiled a new edition of Galen with special reference to pulse lore and urinoscopy in which he again made the statement that the urine was produced in the inferior vena cava; his rules for treatment were purely symptomatic.

The only outstanding writer of this period was Paul of Aegina[1] (625–690) who had been a student at Monte Cassino. Paul, however, declared that there was nothing new in medicine, and we have seen that he recommended practically nothing as a remedy for the plague, for which even now we can certainly not blame him. He signed himself "a humble scribe," and that is exactly what he was. Among his writings he undertook to reduce to seven the seventy volumes of Oribasius,[2] written at the court of Julian the Apostate in 331–363, keeping intact chiefly the books on gynecology and surgery. He evidently wrote the seven volumes, called the Pleiades, but one of them is lost, and unfortunately our only knowledge of his text on gynecology comes from later writers and an occasional item in some of the surgical books. It has been suggested that his arrangement of topics was that of the long poem of Salerno almost five hundred years later.

If we look a little more deeply into the gynecological teachings of Paul of Aegina we shall see that, such as they were, they were followed for hundreds of years by the midwives of Europe who had translations or copies of his work. He rediscovered several instruments long neglected, among them was the vaginal speculum, known to the Greeks and Romans before Christ, and the trocar and cannula for draining ascites from the abdomen, and a crushing instrument for the cure of hemorrhoids, and ligatures as well as cauteries for stopping hemorrhage, and he recommended a method of podalic version

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Sarton, Introduction to the Hisiory of Science, 1929, vol. 1, p. 464.

[1] Thorndike, L. Magic and Experimental Science. p. 616.

[1] Paul of Aegina. De Re Medica, libri septem.

[2] Oribasius had been commissioned by the Emperor to travel and collect copies of Galen.

in difficult labor, forgotten since the days of Cleopatra. For children he prescribed soothing lotions for sore gums, hot baths for convulsions, and suppositories for constipation. Among surgical operations he described one for removal of a cancerous breast, but he regarded cancer of the uterus as hopeless from the first and not suitable for operation. Withington considers Paul the most important product of the school of Alexandria, and we find that he was so kind and helpful to the midwives among the Mohammedans that they often called on him for help in difficult labor cases although this was against the law of the Moslems.

What was the final condition of Paul's texts it is difficult to imagine, for they were first translated into Arabic, then back into Latin and from Latin into Greek, until by the time they were printed in Latin, in 1528, they must have varied widely from the original, and sometimes the author's name was given as Christopherus Orosius or Christobal de Orosco, or Paulos Aeginita, until, finally, the books were translated into English by Francis Adams, in 1844–1847, as by Paul of Aegina. Such as they were, however, they gave to women doctors for centuries their main texts on gynecology and obstetrics, and became one of the sources of another encyclopedia written at the great medical school of Salerno in the eleventh century, in which no medical topic was omitted.

We have found that in the sixth century monasticism was gaining headway all over the known world.[1] This movement increased in the seventh century like a great wave of piety as well as a popular method of relief from the turmoil of war. Both men and women entered convents where they lived busy but quiet lives. There the men cultivated the soil and copied manuscripts while the women went to school to learn whatever they chose,—household arts, teaching the Bible, psalm singing, and especially the care of the sick. It was from the convents that women went into public life to help the poor and infirm as well as to heal the wounded and treat the lepers. These early convents were by no means prisons, for their occupants consisted of men and women from all classes of society who wore no special garb and were at this time not under rules or vows. They were so much more independent than in their own homes that many an unhappy widow gladly left her relatives for the community life miles away from them. We might almost call these monastic women early medical missionaries, for as soon as they had learned the art of healing they journeyed far and wide with their soothing remedies. Historians tell us that in England and in Scandinavia the women of the early Middle Ages with their newborn babies could travel anywhere on foot or on horseback without being molested, finding brass dishes hanging on stakes from which to drink at every spring.[1] Those who were Christians might be distinguished only by their lack of jewelry and somber gowns. Both men and women, however, wore their hair loose and long or in curling locks which hung below their small caps, and their tunics, stoles, capes and sandals were often elaborately embroidered, so that it is difficult to distinguish the sexes in the illustrations of the old manuscripts.

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[1] Eckenstein, L. Woman under Monasticism. 1896.

[1] Bede, Ecclesiastical History, Bohn Lib., 1849, Chap. XVI, p. 100, is authority for this statement as of the year A.D. 634.

Also Wright, T. Womankind in all Ages of Western Europe. 1869, p. 21.

Because of their education women were quite naturally appointed by the church officials to rule over the monasteries since in their homes they always had authority. Such women soon became earthly magistrates and spiritual mothers, boldly making war on idleness, and severely punishing laxity of morals, and carrying on large institutions of learning where men as well as women were taught not only the Seven Liberal Arts but whatever was known of medicine. Among the most famous of these monastic rulers in the seventh century was Berthildis, the Regent of the whole Frankish kingdom in 655.[1] She was then the widow of Clovis II although born an Anglo-Saxon slave of the royal family in Kent. She was educated at home, having studied medicine there with other women practitioners as was the custom. Following Radegonde's example, Berthildis restored the Abbey of Chelles, near Paris, and placed over it Bertile (652–702), a learned nun born near Soissons. Together they put an end to slavery in their region, abolished the oppressive head-tax on men and cattle, although cattle were still legal tender instead of other money. Thus they incurred the hatred of the politicians and were continually harassed by their neighbors, until, in weary desperation, Berthildis retired to the monastery of Chelles[2] which she had restored, devoted herself to medical work for her people, and drew large audiences to her lectures on medicine and hygiene. She died in 680.

Some years after the death of Berthildis the sister of Charlemagne, Giselle, ruled this same monastery both wisely and well and in the meantime it had become very popular with the nobility of England as well as of France, and nobles sent their daughters across the Channel to be educated at Chelles, some of whom founded convents in England on their return. One of these women was named Mildred, and to her King Ecgberht who ruled over Kent from 664–673 gave as much land for a monastery as a deer could run over in one course, i.e., 10,000 acres. Historians say that she ruled with great success, and because of her medical skill she cured hundreds of seemingly hopelessly sick patients during her life, and they also affirm that after her death the very dust from her tomb and from the rock where she landed at Ebbsfleet cured many diseases if merely mixed with water and applied to the body.

Among the other famous Abbesses who ruled monasteries in England in this same century were Berthagyta (sometimes called Adelberger or Ethelberga), Queen Etheldrida, Hilda of Whitby, Walpurga, Theodolinda, and Ottila or Odilia, each noted for her ability both as a ruler and physician. Berthagyta[1] was a descendant of Clotilda (see p. 496), daughter of Haribert, King of the Franks by his Saxon wife, Ingoberg. She was married in France to Aethelberht of Kent and went to England accompanied by the Bishop of Senlis. Their court was at Canterbury, and from there Berthagyta corresponded with Pope Gregory the Great who lived 540–604, and thus prepared the way for the mission of Saint Augustine to England in 597, as we have seen. In the course of a few months her husband, the King, was converted to Christianity, and baptized by Augustine, after which the new religion spread rapidly throughout Kent. Bede,[1] the great historian, says that Ethelberga, as he called her, was known all over the world for her wisdom. He compares her with Saint Helena, the mother of Constantine, and adds that she established the first Benedictine nunnery in England. This was at Barking, in Essex, and during the rest of her life, he says, "Ethelberga governed wisely and well, teaching medicine to the women under her care, healing the sick, and tending them with great skill." She died not long before 616.[2] Thus we see the influence of Saint Benedict and his sister Scholastica spreading to far away England, and here we have another proof that the women studied medicine not only at Alexandria and with other women, but also at the monasteries and nunneries of England and France.[3]

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[1] Eckenstein. *Op. cit.*, 1896, p. 85.

[2] Eckenstein. *Op. cit.*, 1896, p. 85; see also Welch, A. K., *Op. cit.*, 1913, Chap. 1, and Mrs. Jameson, Legends of the Monastic Orders, 1852.

[1] Welch, A. K. *Op. cit.*, Chap. 1. Neuburger, M. *Op. cit.*, Vol. 2, p. 9.

Queen Etheldrida was the daughter of Ine (or Anna), king of the East Angles. Her dowry from Tonbert, her first husband, was the island of Ely, where is now the great cathedral, and there she practiced among the nuns, teaching them how to treat diseases and to serve the poor. They tried to cure the lepers[4] but their success could not have been great. Bede[1] says that when the young Etheldrida, herself, was sick and about to die of an abscess in the neck, a monk named Cynefrid was called in consultation; he lanced the abscess and gave her great relief, but evidently her system had become poisoned and she died four days later (660). Bede tells us further that this saintly woman believed that the Lord had sent such a sickness because she had been vain of her beautiful neck and had adorned it with jewelry in her girlhood. He also says that when her body was exhumed sixteen years later it was perfectly sound and the wound was miraculously healed. Green[2] calls her Queen Aethelthryth, wife of Ecgfrith, King of Northumbria, her second husband, and says that she founded the Abbey of Ely, and there performed miracles of healing, but whatever her name, there is an authentic tradition of her medical ability and her charity to the sick. In her memory her father, King Ine, or Anna, when in Rome in 688 during his old age, founded the San Spirito Hospital, not far from Esculapius' hospital on the island in the Tiber.[3]

Perhaps the most famous of these royal Abbesses was Hilda of Whitby.[4] She, too, lived in this century (614–680), the niece of Edwin of Northumbria, an Anglo-Saxon princess "born to the purple," and she was converted to Christianity by Paulinus, the first bishop of Northumbria, in 627. As soon as Hilda was baptised, says Bede,[1] she wished to go at once to Chelles and Poitiers to study medicine. The bishop, however, urged her to study at a small monastery near the river Wear, and in 648 he placed her at the head of an abbey at Hartlepool on the Northumbrian coast where he consecrated her the first nun in England. In 655, however, King Oswy or Oswiu, who had succeeded Ecgfrith, requested Hilda to take charge of his estates and assume the care of his little daughter Aelfleda.[2] An interesting story of Hilda's medical skill shows us this little girl evidently very ill with appendicitis, and in such agony with cramps in her bowels that she could not stand erect. When Hilda was almost in despair of the little sufferer's life she placed the girdle of Saint Cuthbert, with holy water, on the child's abdomen, and she recovered!

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[1] Bede's Ecclesiastical History of England, Bohn Lib., 1849, is the chief authority for many of these facts.

[2] Jameson. *Op. cit.*, p. 65.

[3] Dugdale, Sir W. Monasticon Anglicanum, 1665–1673, vol. I, p. 405.

[4] Bishop John, according to Bede, could cure almost anything by breathing on the patient and by prayer (pp. 238–244). When Herebald's skull was broken by a fall from a horse, Bishop John breathed on him and ordered a surgeon to bind the head tightly. The cure was immediate (686 A.D.).

[1] *Op. cit.*, chap. xix, p. 206.

[2] Short History of the English People. Vol. I, p. 60.

[3] Anglo-Saxon Chronicle. Ed. by J. A. Giles. Bohn Lib., 1849, p. 330. King Ine had succeeded to the Kingdom of the West Saxons and had built the Minster at Glastonbury.

[4] Encyc. Brit., Art. Hilda; and Eckenstein, *Op. cit.*, Chap. iii.

In 657 Hilda built Whitby Abbey, a double monastery for men and women on the coast of the North Sea, where for thirty years she taught medicine, theology, grammar, music and all the known arts. Bede[3] tells us that "five bishops were taken from her monastery." She superintended the communities as a good business woman, visited the sick in the hospitals, gave advice as to the proper seasons for bleeding the patients, raised the herbs for medicines, planned the crops for food, and was always called in consultation with the medical monks in time of the serious sickness of any of the community folk. It is said that when an Abbess from another monastery was suffering from blood-poisoning in the arm, and was "given up to die," Hilda found that although the Abbess had been bled at the correct time of the month, the high tide of a waxing moon, the arm needed poulticing and prayer, and so the Abbess was healed.

Hilda's monastery at Whitby was chosen for one of the greatest synods of the Church. The delegates as they traveled along the narrow roads presumably had been quarreling as to the correct tonsure and the proper date for Easter, but when they arrived at Whitby they were so amazed at the beautiful and practical buildings of the community that they forgot their differences and fell to admiring especially the hospitals and the sanitary arrangements of the estate. There is, of course, another version of this story which shows us that the advocates of the Roman customs won in their religious argument against the Irish bishops by sheer force of logic based on the simple fact that the Keys of the Church had been given to Peter and not to the Irish saint, Columba.

We may suppose that Hilda, like Radegonde, had a corps of trained assistants or nurses to do the actual work of the hospital. It would have been impossible for one woman to do what it is said Hilda accomplished—among other kind deeds, that of teaching the Bible stories to Caedmon which he turned into beautiful songs.[1]

Hilda died in 680, and the King's daughter, Aelfleda, great-granddaughter of the Saxon Edwin, became Abbess in her place. She, like Hilda, was skilled in all the arts of medicine and surgery, and she gave her personal attention to the patients.

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[1] *Op. cit.*, Chap. xxiv, p. 151.

[2] Bede, *Op. cit.*, Chap. xxiv, p. 151.

[3] We should not forget that Bede was writing a history of the Christian religion, not of medicine in England; it is therefore not surprising that he reported only cures due to prayer and holy relics. *Op. cit.*, p. 213.

[1] See the edition de luxe of the Caedmon prepared by Sir Israel Gollancz, 1927.

[From Fernelius' Universa Medicina, Geneva, 1679.]

EDITORIAL

TEACHING THE HISTORY OF ANATOMY

A RECENT *Bulletin* of the Institute of the History of Medicine of John Hopkins University[1] is devoted to an "Exhibit illustrating the History of Anatomy," which was opened in May in the Exhibition Room of the Institute of the History of Medicine as part of a seminar course on the history of anatomy and physiology. The exhibit was entirely the work of first year students; one student or two together devoting themselves to a period in the history of anatomy, upon which they wrote a paper and prepared the exhibit illustrating its subject. In an introductory note Professor Sigerist states: "The exhibit, therefore, is entirely the work of the students. They made the selection of the pictures and books to be exhibited; they wrote the legends to the exhibited objects, and they wrote this catalogue." These young men deserve to be heartily congratulated for this most creditable result of their labors. It is impossible to notice the individual sketches which the *Bulletin* contains. Beginning with the primitive anatomical drawings of the Aurignacian period, continuing with the history of anatomy in Babylonia, Egypt, China, Greece and Rome, brief well-written abstracts epitomize what we know of the anatomical knowledge of the Ancients. The exhibits show the commencement of the modern science of anatomy with Vesalius and his illustrations, contemporaries and immediate successors; the discovery of Harvey and the beginning of the science of microscopic anatomy by Malpighi and Leeuwenhoeck in the seventeenth century and continue down to the development of the cell doctrine and modern embryology in the nineteenth century.

This Exhibit may be considered as marking a great step in the progress of the scientific teaching of medical history in this country. It is not only intrinsically valuable to those who have been fortunate enough to view it but it also indicates a method which should be employed by those who desire to arouse or stimulate the interest of students in the subject. It is an extension or expansion of the means employed so successfully by Osler in the groups which he gathered about him in Baltimore and elsewhere, inspiring them by securing their participation in the work. It is to be hoped that Professor Sigerist's idea will be put in general use by teachers of medical history.

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[1] Reprint from the *Bull. Hist. Med.*, 1: No. 6, July, 1933, Supplement to *Bull. Johns Hopkins Hosp.*, 58: No. 1, July, 1933.

BOOK REVIEWS

Nutrition. By Graham Lusk, sc.d., m.d., ll.d. Late Professor of Physiology, Cornell University Medical College, N. Y.; etc. With 13 illus. Clio Medica. N. Y., Paul B. Hoeber, Inc., 1933.

The latest addition to the valuable series of monographs under the general editorship of Edward B. Krumbhaar with the title "Clio Medica," was the last contribution to medical literature made by Graham Lusk before his lamented death, and it possesses an importance much above its length because it is a summing-up of the history and progress of a branch of medical science of which the author was one of the leading exponents. The short preface by Eugene F. DuBois states concisely why Dr. Lusk was such a great teacher and has left such a powerful impression on his pupils, many of whom have in turn carried high the torch of knowledge which they received at his hands.

Beginning with a review of the knowledge and views of the classic ancient authorities on the subject of nutrition, Dr. Lusk goes on to summarize the scanty material left by the writers of the Middle Ages. The seventeenth century is marked by the great developments in the sciences of anatomy and physiology which mark the advent of scientific medicine, and the development of the science of chemistry by Black, Cavendish, Scheele and Lavoisier which finally laid the foundation for a correct knowledge of metabolic activities and tissue change. Lusk devotes two chapters to the history of the knowledge of nutrition in the nineteenth century. In Chapter vi he deals with the French School, whose great representatives, Guy-Lussac, Magendie and Claude Bernard, cleared the way for the German School, of which the leaders were Liebig, Bidder, Schmidt and Carl von Voit. The last chapter deals concisely with some of the modern developments during the present century.

Dr. Lusk was a past master in the art of presenting any subject on which he wrote with a conciseness not at all incompatible with completeness and lucidity and the present volume illustrates this gift in the most marked degree. It is concluded by an excellent bibliography and index of personal names and subjects.

History of Urology. Prepared under the auspices of the American Urological Association. Editorial Committee: Edgar G. Ballenger, William A. Frontz, Homer G. Hamer and Bransford Lewis, Chairman. 2 vols. Balt., Williams & Wilkins Co., 1933.

Although the surgery of the male genitourinary tract has from the earliest times been one of the most important branches of surgery, it is only in comparatively recent years that it has been accorded the rank of a speciality. Operations for stone in the bladder were performed by the ancient Hindoos and we might recall that portion of the Hippocratic Oath which forbids physicians to perform lithotomy. In Europe the operation of lithotomy was well understood and practiced during many centuries, the names of certain specialists in lithotomy such as Germain Colot, Frère Come and Frère Jacques, besides the more famous surgeons Fabricius Hildanus, Ambroise Paré, and later Cheselden, having descended to us as particularly famous for their skill. In more recent times, particularly in England and France, many of the greatest surgeons were notable for their skill in genitourinary surgery. But their work was chiefly confined to the treatment of strictures of the urethra, stone in the bladder, gonorrhea and syphilis. In the United States the fame of Philip Syng Physick of Philadelphia rivaled that of his contemporary the great Dupuytren as an operator on the bladder, and Henry J. Bigelow, of Boston, introduced a new era into the surgery of the bladder by his introduction of litholopaxy in 1878. Samuel D. Gross, of Philadelphia in 1851, published his great book on diseases of the genitourinary tract, the first special work on the subject by an American author, and in the same year Dr. William H. Van Buren was appointed to the first chair of urology in the United States, that of Clinical Professor of Genito-Urinary Diseases in the University of New York. From this time the growth of urology as a speciality was rapid. In 1902 the American Urological Association was founded, and to it we owe this splendid publication recording the history of the speciality in the most adequate manner.

In the thirty chapters which are contained in these two large volumes every aspect of urology is covered by over thirty specialists of the highest standing in their respective subjects. The bibliographies appended to the individual articles are very notable additions to their value. The first seven chapters deal with the history of the American Urological Association, and with the early history of the speciality in Baltimore, Boston, Chicago, the Middle West, New York and Philadelphia, and the West Coast, and they demonstrate the truly remarkable contributions which the surgeons of the United States have made to the science. The remaining chapters, dealing with the different special departments and aspects of urology, many of them accompanied by illustrations, may almost be regarded as a composite textbook of modern urology.

The Editorial Committee is to be congratulated not only on the eminence of the various contributors whom they secured but on the skill with which they have worked their contributions into a harmonious whole, and the Association has laid the profession under a debt of gratitude for undertaking the sponsorship of a work of such great value to medical history.

The Heroic Age of Science. The Conceptions, Ideals, and Methods of Science among the Ancient Greeks. By William Arthur Heidel, Research Professor of the Greek Language and Literature in Wesleyan University, Research Associate of the American Council of Learned Societies and of the Carnegie Institution of Washington. Pub. for Carnegie Institution of Washington by the Williams & Wilkins Co., Baltimore, 1933.

This concise but thorough study of the methods and development of science among the Greeks from the sixth century to 100 B.C. will prove of inestimable value to all students of the history of ancient medicine. One of its most useful attributes is to dispose very thoroughly of many misconceptions which have been passed on from one writer on the period to another and which have interfered very seriously with a proper understanding and appraisal of the real character of the scientific contributions of the Ancient Greeks to medicine and many other branches of science. In Part 1 Professor Heidel gives a general résumé of the Conception and Ideals of Science which prevailed among the Greeks, incidentally reprooving the very prevalent prejudice that the ancients had nothing which was worthy of the name science, and then showing how really scientific were the achievements of many of those whom modern writers class as "philosophers," who, as the author points out, should more properly be known as "natural philosophers," directing attention to the fact that even a comparatively few years ago works on physics were generally classed as "natural philosophy," and Greek Science might well be spoken of as natural history.

Some reasons why the Greeks at an early period devoted themselves to the study of natural science and developed it to a high degree are found in their early emancipation from superstitious and magical beliefs, in the non-dogmatic character of their religion, and in the absence of a hierarchy of priests. Freedom of thought prevailed to a greater degree than in any other land, and it was to this freedom that we owe the glories of Greek science. Escaping the tyranny of superstition and magic, Greek science was also free from the domination of astrology.

Space will only permit us deal with to the portions of Professor Heidel's work which deal with medical science. The Greek natural philosophers all dealt with subjects which were, strictly speaking, medical, and the medical teachers and writers were all natural philosophers, including all the various branches of natural science in their studies. We know no more beautiful tribute to the moral ideals as well as the scientific achievements of the ancient Greek physician than the pages in which Professor Heidel describes the ideals and methods which they employed in their research and practice. He disposes effectually of the false idea that Greek medicine and natural science was largely based on theories and not on observation and experiment. It is hard to see how such a misconception could prevail in the minds of any who had read the Hippocratic Corpus, or knew of the observations of Aristotle, or the most scientific experiments performed by Galen. The absence of mechanical aids is too often overlooked in considering Greek science, but what the eyes and hands of an observer destitute of such aids could accomplish, was performed by the Greeks to a truly astonishing extent. As Heidel says, "Greek civilization was as little mechanical as possible," and the time had not come when industrial workers used machines to any extent in their labors yet, "Investigation would probably show that by far the largest number of instruments which have been employed in our time with such success in scientific experimentation were taken over either bodily, or with slight alterations for greater precision, from the workshops of industry." The progress of Greek science was also rendered difficult by the comparative scarcity of workers and the difficulty of ready communication between them. Contrast conditions in Greece with our busy, populous laboratories, numerous scientific societies and meetings, and innumerable journals and books. The author notes the exceptions to be found in the schools of Plato and Aristotle and the later ones at Alexandria, but they are outstanding exceptions. A great lacuna in our knowledge of the methods employed by the Greeks is the absence, except in a few important instances, of records of the means by which they arrived at their conclusions or discoveries, what we would now term laboratory or clinical records. But those which have been preserved, especially the writings of the Hippocratic authors and of Galen, are sufficient examples to show that the Greek physicians employed methods as scientific as our own. The story of the development of the various schools of Greek medical thought is extremely interestingly traced and though no attempt is made by Professor Heidel to give a detailed history of these various developments his synoptic view is most valuable and enlightening. "The fatal weakness of Greek medicine was the result of an inadequate development of physiology," due largely to lack of human dissection and drawing false inferences from supposed analogies found in the anatomy of the lower animals to the human. Professor Heidel quotes many instances in which various physiological phenomena were wrongly explained because of utterly false analogies drawn from various physical phenomena. He gives many instances from various Greek writers showing how generally experimentation was carried on in their investigations, and quotes from the "Clouds," Aristophanes' well-known jest about the school of Socrates experimenting with a flea to determine the distance it could jump, which indicates that such experiments were actually performed. Herophilus used a clepsydra to time the pulse many centuries before Sir John Floyer invented his pulse-watch, and the Hippocratic Corpus contains an account of how patients were made to vomit and the stomach contents examined at regular intervals to study the digestion, and in the same writings one finds a description of placing a score or more of eggs under some hens to hatch, and opening an egg a day on successive days to observe the embryo.

Professor Heidel's work is one of the greatest importance to the student of medical history. It correlates and throws new light on the first beginnings of real medical science.

CATALOGUS VAN DE BIBLIOTHEEK DER NEDERLANDSCHE MAATSCHAPPIJ TOT BEVORDERING DER GENEESKUNST. In Bruikleen Vereenigd met de Bibliotheek der Universiteit van Amsterdam. Amsterdam, Internationaal Antiquariaat (Menno Hertzberger), 1930.

The Dutch Society for the Advancement of Medicine founded its library in 1849. At death's door within a year, it was preserved by the "enthusiastic and poetic secretary" of the Society, Dr. J. P. Heye, who persuaded each of the 900 members to donate one volume each year. It acquired its special quality, which incidentally gives the present volume its special value to bibliographers, in 1860 when the librarians were instructed to collect: (1) Works of Netherland authors about medicine and allied sciences; (2) Medical works of foreign authors, printed in the Netherlands or in the Netherland colonies; (3) All the writings, of interest from a medical point of view, concerning the Netherlands and their colonies. These rules still hold good today. This steadily growing library published the 17th supplement to its catalogue in 1923 (card cataloguing having made but little progress in Holland) so that it was recently decided that it was time for a complete new catalogue. The titles, which must number close to 20,000, are catalogued in sections, according to the method used by the University of Amsterdam, where the collection is housed. These comprise: General, Bibliography, History, Biography, Anatomy, Physiology, Pathology and Therapy, Surgery, Obstetrics and Gynecology, Pharmacology, Hygiene, Vital Statistics, Public Health, Legal Medicine, Veterinary Medicine, Botany, Zoology, Natural History, Physics, Chemistry, Periodicals, Manuscripts, Letters, Drawings. Two hundred columns of index facilitate the finding of an individual work, so that a double approach is thus made easy for the user. Space forbids any detailed consideration of the treasures listed. The rare Dutch incunabula, 16th century woodcut books, numerous 16th and 17th century works on the plague, 400 editions of Boerhaave, a *complete* set of Camper's works with many of his manuscripts and drawings and an unrivalled collection of items on the medical history of the Netherlands are among the desiderata that make one long for a chance to visit this collection. There are times when the absence of a card index has its advantages!

E. B. KRUMBHAAR

GEDANKEN EINES ARZTES ÜBER SEELE, NATUR UND GOTT. By Dr. F. Parkes Weber, Arzt am Deutschen Hospital in London. Deutsche Übersetzung von Dr. J. P. zum Busch, Früher Chirurg am Deutschen Hospital in London. Stuttgart, Ferdinand Enke, 1933.

These 17 articles, now gathered together from the *Medical Press* and other journals appearing between 1903 and 1932, give German readers better access to the philosophical essays of this distinguished British physician than is available to the English speaking world. As indicated in the title and explained in his wife's German preface, the essays can be considered under the three aspects of psychology (including psychoanalysis), medicine in a narrower—but still a somewhat literary—sense, and faith.

Thinking and Dreaming, Free Will and Heredity, the Passion for Games, are samples of the first variety; Exercise, Work, Rest and Sleep; Therapeutic Fasting; Action and Reaction in Pathology; Vicious Circles, of the second group; and the Rights of Nations as compared to the Rights of Individuals; Nature and God, of the third. Composed in non-specialized language, these little essays form both pleasant and valuable comments that should interest a wide range of medical readers. Readers not sufficiently familiar with German to appreciate them in this form should consult the references given in the Table of Contents to look up the English originals. Those who are at all familiar with Dr. Weber's charming personality will realize not only that it has of course permeated his writings, but that it has also been well preserved in the translation.

E. B. KRUMBHAAR

THE HISTORY AND EPIDEMIOLOGY OF SYPHILIS. Gehrmann Lectures, University of Illinois, 1933. By William Allen Pusey, M.D., LL.D. Springfield, Ill., Charles C. Thomas, 1933.

The three lectures contained in this volume cover the subject with which they deal in the most practical and thorough way. In the first Lecture, Dr. Pusey sums up most impartially the vexed and much written about controversy concerning the European or American origin of the disease. Along with almost every student of the subject, with the notable exception of Sudhoff, Pusey is convinced that it was an American disease and was imported into Europe by the crews of Columbus. He cites all the main reasons for this view and they certainly are much more convincing than those which he cites in support of the European origin.

The second Lecture is concerned with the "Development of Our Knowledge of Syphilis." An immense literature on syphilis began from a very early period and the Author is evidently familiar with all its aspects. He not only describes the contributions of Fracastorius, Paracelsus, Fernel, Paré and Astruc, but notes much that was written by many more obscure authors. Particularly interesting is his account of the work done during the latter part of the eighteenth and early years of the nineteenth centuries, including John Hunter's memorable error in confusing syphilis and gonorrhea, and Ricord's great work in overcoming its results. The last Lecture on the "Epidemiology of Syphilis" is not only interesting from the historical point of view but also valuable for its practical suggestions. Dr. Pusey has written a most valuable contribution to a subject of universal interest not only to physicians but also to laymen. His vast experience, great erudition and impartiality, combined with excellent literary style, make this book one of exceptional merit. There are many good illustrations and an adequate index.

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CONTENTS OF NEW SERIES, VOLUME FOUR, 1932

[illegible] Books of Observations [illegible] Hygiene of the Soul; [illegible] Times of Dr. William [illegible] Leonardo Da Vinci as a [illegible] of the University of Bologna [illegible] in Mexico Prior to 1600; [illegible] sity of California Medical School [illegible] London and Edinburgh [illegible] in the 16th Century; [illegible] St. Philip's Hospital in [illegible]

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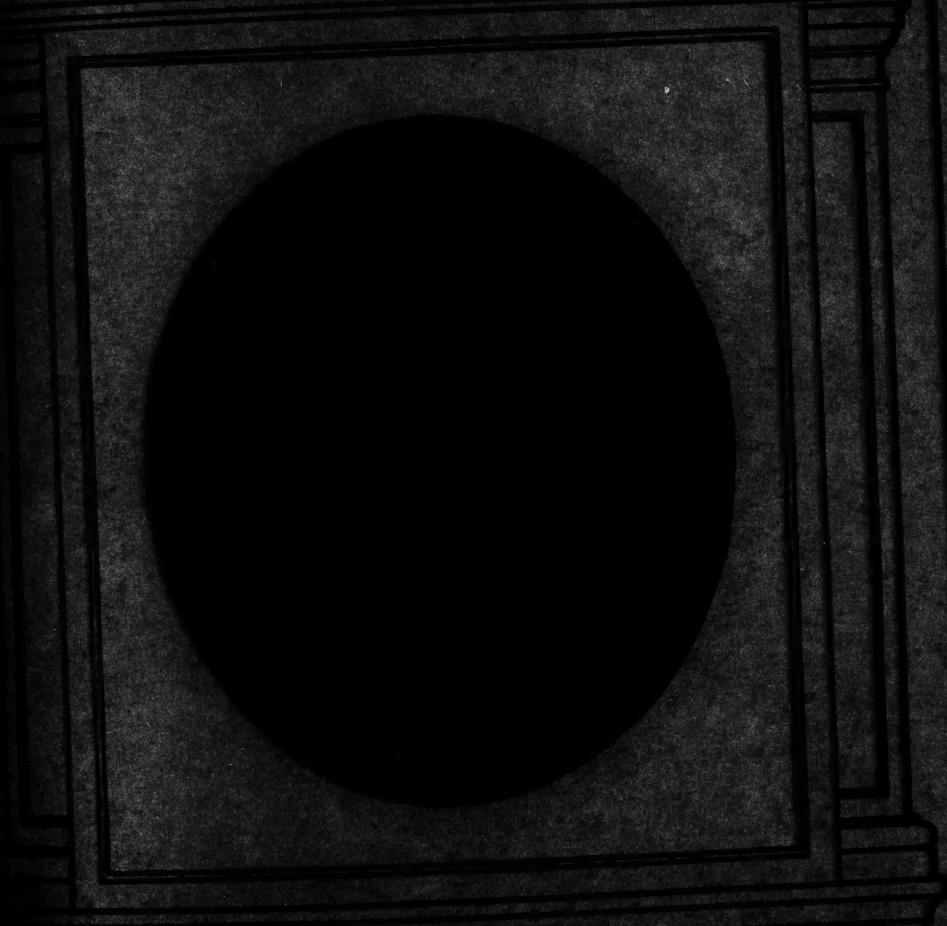

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CONTENTS OF NEW SERIES, VOLUME ONE, 1929

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CONTENTS OF NEW SERIES, VOLUME TWO, 1930

ROLLESTON, Sir Thomas Browne; SUDHOFF, [illegible]; CRUMMER, Original Drawing of the Title Page of Vesalius' Fabrica; CHANCE, On Hippocrates and the Aphorisms; MAJOR, History of Taking the Blood Pressure; FRANCESCHINI, Lazzaro Spallanzani; HALL, General and Medical Science 100 Years Ago; BENSON, Otto—Pioneer Teratologist; SCARLETT, Jean Paul Marat, The Physician as Revolutionist; WILSON, Semmelweis; PLEADWELL, Ninian Pinckney, Letters; [illegible], Roman Archiatri and [illegible]; COOPER, The Medical School of Montpellier in the 14th Century; FLEETWOOD, The Irish School of Medicine; JACOBSEN, John Coakley Lettsom and His Relations with Jonathan Carver, Explorer; CAMDEN, Elizabethan Astrological Medicine; MILLER, Apollo; BRAGMAN, The Medical Wisdom of Nathaniel Hawthorne; ROLLESTON, Medical Friendships, Clubs and Societies; WILSON, Alphonse François Marie Gouttés; HUME, Medicine in China, Old and New; HOWARD, Doctor George [illegible] and His Times; BROWN, Cotugno, His Life and Works; SHRYOCK, Public Relations of the Medical Profession in Great Britain and the United States 1600–1870; Incunabula in New York Academy of Medicine, Library of Washington University School of Medicine, Medical Library of the University of Rochester, Cleveland Medical Library Association, Boston Medical Library, Lane Medical Library, Stanford University; WARTHIN, The Physician of the Dance of Death; HARE, Stephen Girard and the Great Epidemic of Yellow Fever in 1793; DENNINGER, History of Substances known as Aphrodisiacs; MILLER, History of Syphilis; MONTGOMERY, Hieronymus Fracastorius, Author of a Poem Called Syphilis; HIRSCH, Historical Survey of Gonorrhea; LEOPOLD, Aretaeus the Cappadocian: His Contribution to Diabetes Mellitus; JONES, Practice of Medicine Among Our Aborigines; LLOYD, Benjamin Rush and His Critics; PACKARD, William Hunter's Obstetrical Cases; CAULFIELD, Infant Welfare Movement in the Eighteenth Century; ROGERS, The History of Craniotomy; TELLO & WILLIAMS, An Ancient Syphilitic Skull from Paracas in Peru; PITFIELD, John Keats, Reactions of a Genius to Tuberculosis and Other Adversities; MAJOR, [illegible]; MOORMAN, Tuberculosis and Genius as Manifested in [illegible] Francis of Assisi; GOLDSTEIN, Influence of Claude Bernard on Physiological Chemistry; MIDDLETON, John Syng Dorsey; [illegible]; VON STORCH, Essay on the History of Epilepsy; HOOVER, Significance of the Scientific Conquest of the Air.

CONTENTS OF NEW SERIES, VOLUME THREE, 1931

CASTIGLIONI, Rise of Medicine as Science in the 17th Century; THORNDIKE, Letter from a Physician of Valencia to His Two Sons; BARNARD, An Ancient [illegible]; AST, Christopher [illegible] Service in the Old Days at [illegible]; SHIELDS, Thomas Dale, M.D.; [illegible] Andreas Vesalius; SCHNEIDER, Music [illegible] the Dance of Death; [illegible] the University of [illegible] Library of [illegible]; Library of the College of Physicians of Philadelphia, Library of the Royal College of Surgeons of England; POWER, Touching and the Cure of the King's Evil; BAST, Max Johann Sigismund Schultze; MACHT, Louis Lewin; WALSH, Refutation of the Charges of Cowardice Made against Galen; DUNN, Galen; MAJOR, Landmarks in the History of Lead Poisoning; MILLER, The Pneumatic Institution of Thomas Beddoes; ROLLESTON, History of Cinchona and Its Therapeutics; EBBELL, Edwin Smith Surgical Papyrus; FRANCHINI, Ch. Alphonse Laveran; DRAKE, Pap and Panade; RUDD, John Francis Delong, A Frontier Physician; PODOLSKY, Physician Physicists; CLEMENS, Notes on English Medicine (George IV–Henry VIII); SARMA, Hindu Medicine and Its Antiquity; BARNSLEY, Dr. Samuel Bard; HALDIN-DAVIS, Foundations of British Dermatology; JELKS, John Gamgee; ARMSTRONG, Thomas Holley Chivers; CHANCE, Nicholas Culpeper; PACKARD, Two Unpublished Letters of Matthew Baillie, M.D.; MOORMAN, Tuberculosis and Genius—Francis Thompson; HALLERAN, An Unpublished Diary of [illegible]; [illegible], Persian [illegible]; [illegible], Erasmus Darwin and His [illegible]; CAWADIAS, [illegible] to Galen; WILSON, Dr. J. C. Nott and the Transmission of Yellow Fever; WEBB AND GILBERT, Theodor Kocher; BRIGHAM, Richard Dan's Tomb; PARSONS, The Adventurous Goldberger; MONTGOMERY, Naming of Alopecia Areata; BROWNING, Relation of Physicians to Early American Geology; LAMBERT, Phineas Fletcher and Francis Quarles and the Purple Island; LUSK, Carl von Voit, Master and Friend; CRAVENER, An Orthopedic Clinic of 1167 A.D.; FRANKLIN, Richard Lower and His "De Corde"; BENSON, Anton Tchekhov; KEMBLE, Henry VIII; MOORMAN, Tuberculosis and Genius—Voltaire; CARSON, The [illegible] Pasteur; WEHNERT, Gigantism and Acromegaly.